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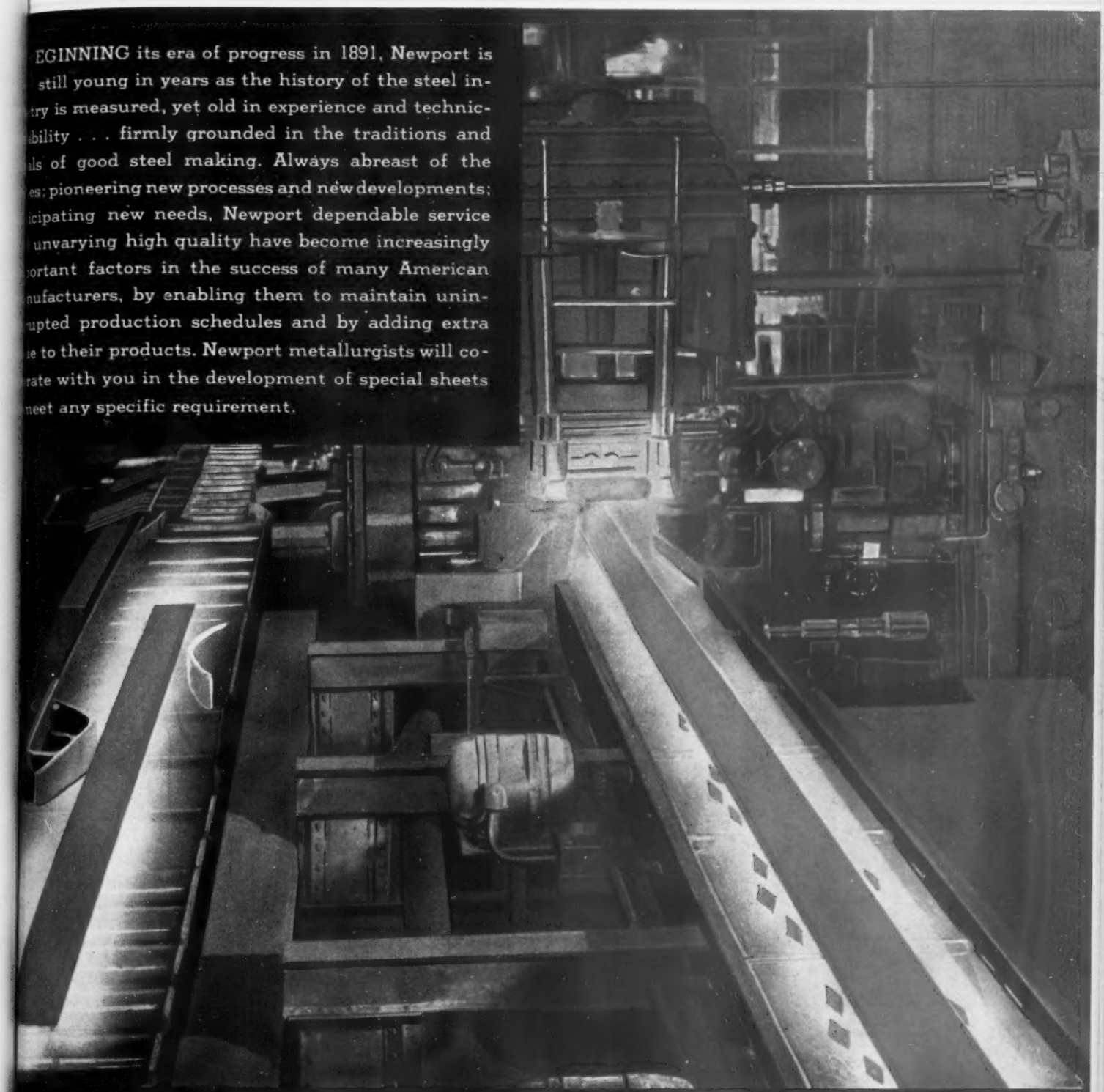

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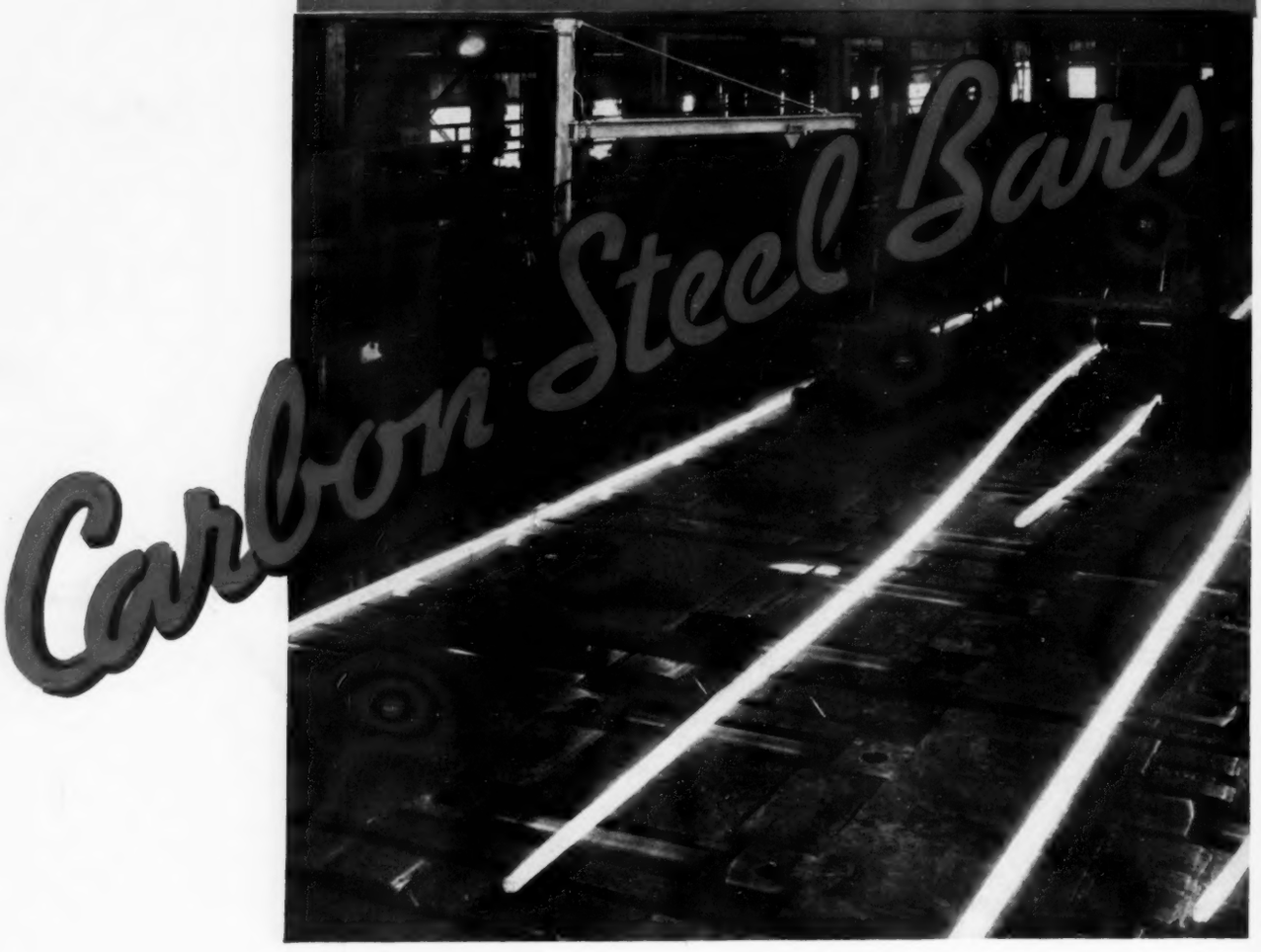

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STEEL

PRODUCTION • PROCESSING • DISTRIBUTION • USE

For forty-eight years—IRON TRADE REVIEW

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As the Editor Views the News

TWO events in Washington last week helped to convince despairing industrialists that congress, when goaded sufficiently, still can muster a pretty fair showing of common sense. The house, after voting a heavy majority in favor of submitting the dangerous Frazier-Lemke farm mortgage relief bill to vote, proceeded to kill it by a decisive 235 to 142 ballot. This is reassuring evidence of sanity. The second manifestation was the action of the senate finance committee in reneging on the administration's abortive corporation tax bill (p. 29), after expert testimony of industrial groups, accountants and others had shattered most of the arguments advanced in its favor.

• • •

Labor Blocks Inflation Threat

Observers in industry should not overlook the real significance of the victory over the Frazier-Lemke threat of inflation. Undeniably the protest by the American Federation of Labor, dramatized by Speaker Byrns at the eleventh hour, was an important factor in the decision. Many representatives—forced to choose between unionized labor and inflation—threw their support to the former. The episode again emphasizes the extent to which the organized labor bloc has won its way into a position of power in national politics. Today this nation is nearer to a labor-dictated government than at any time in its history.

• • •

Thunder at Canonsburg

The glamor of the victory of A. F. of L. at Washington was dimmed somewhat by its partial defeat at Canonsburg, Pa., (p. 19), where the Amalgamated association voted to pursue the Lewis, or industrial union method, instead of the Green policy of crafts unionship in its proposed campaign to organize the steel industry. Apparently the action of the Amalgamated is not a complete victory for the Lewis insurgents. If A. F. of L. organizers, trained in the school of crafts unionism, are to set out to win members for a vertical union, as now seems to be the plan, there will be abundant opportunity for jurisdictional conflict. Even if the Amalgamated persists in its reservation to conduct the campaign according to its own plans, the inevitable attempts of the parent A. F. of L. and the insurgents to chisel in on the party will insure a lively summer in the steel industry.

• • •

Utilization or Sabotage?

Recent conventions have brought forth a number of constructive proposals for national policy. At the A. F. A. convention, W. J. Cameron of Ford Motor Co. presented a strong argument on the theme that efficient production is the key to present problems. In the current week under review, the outstanding address on national policy was Glenn Frank's plea for the economy of plenty. Reduced to one sentence, his recommendation, as voiced to machine tool builders (p. 14), was "Utilize rather than sabotize abundance." When the history of the Rooseveltian era is written years hence, it probably will show that the new deal crashed because its leaders persisted in clinging to the economy of scarcity too long after the state of emergency had passed.

• • •

For Better Distribution

Mill supplymen and machinery distributors, meeting last week in Atlantic City (p. 17), were optimistic over their present status. Judging from the tone of the discussion, relations between manufacturers and distributors have been improved to a marked extent in recent years. Also the economic justification for the mill supply jobber seems to have been accentuated by the experience of the depression. This is gratifying, because the success of the manufacturing industries is dependent in large measure upon the effectiveness of their distribution system. . . . Vacations with pay to employes with service records of five years or more (p. 16) are being granted by many steel companies. This should prove to be good business, especially if it helps to build morale.

E. L. Shaner

Machine Tool Builders Wary Of Federal Legislation

WITH productive capacity of manufacturers of machine tools satisfactorily engaged and with encouraging prospects for new business immediately ahead, the industry is extremely apprehensive as to the effect of pending and proposed federal legislation. Vigorous protests against this legislation were expressed over and over at the thirty-fourth spring convention of the National Machine Tool Builders' association held last week, May 11-12, at the Edgewater Beach hotel, Chicago.

Registration totaling nearly 160 constituted an exceptionally high representation of member companies. At the two general sessions and in the numerous group discussion meetings arranged to consider intimate problems of the industry opinion was wide spread that federal legislation now in prospect, particularly the undistributed profits tax bill now in hearing before the senate finance committee, would be oppressive and disastrous to the machine tool building and general manufacturing industries.

To Continue Protests

At its closing session, the association unanimously adopted a resolution supporting the stand against the tax bill taken by General Manager Herman H. Lind, Cleveland, in the brief filed before the senate committee in Washington two weeks ago. The resolution also provided for future group and individual protests as subsequent developments may warrant.

Several speakers paid high compliments to F. V. Geier, president, Cincinnati Milling Machine Co.; A. H. Tuechter, president, Cincinnati Bickford Tool Co.; J. B. Doan and R. S. Alter, president and vice president, respectively, American Tool Works Co., and several others for an aggressive and impressive fight waged against the bill in Washington on behalf of a group of Cincinnati machine tool manufacturers. This effort was initiated and carried out independently of the association's effort.

Commenting briefly on the argument advanced by this group, Mr. Alter stated that the machine tool industry is a cyclical one with the favorable and unfavorable business cycles extending over several years. As a result, tool builders often find themselves in a nonliquid position. In the last ten years, there were only two years in which it was possible to convert profits into cash. Had the undistributed profits tax been operative in this ten-year period, the industry would have been obliged to reduce its surplus one half, he said.

Mr. Tuechter also commented on the work of the Cincinnati group, asserting it was the contention that the pending tax legislation is unsound. The recommendation was that action be postponed for the present to enable the senate committee to formulate a sound program.

In presenting his semiannual report as general manager, Mr. Lind chose to speak informally on pending legislation and the attitude of the government as they affect the machine tool industry. The feeling exists, he said, that the tax bill will not pass in its present form.

Mr. Lind spoke at some length upon the Walsh-Healey government contract bill which would compel manufacturers selling to the government to produce the goods under drastic code regulations as to hours and wages. This legislation, he said, is being pushed actively by the American Federation of Labor. (See page 30).

The Wheeler federal trade commission bill, passed by the senate two weeks ago, will greatly extend the authority of the commission. Referring to the social securities law, Mr. Lind pointed out that this act will bring into Washington one of the largest bureaus of all time and for a long period great confusion will exist and will be burdensome to industry.

In his address as president, Norman D. MacLeod, president and general manager, Abrasive Machine Tool Co., East Providence, R. I., stated that the past few years have proved the fortitude, capacity to smile in the face of misfortune, and fundamental soundness of the American people. As a result, tool builders can begin to look confidently toward the future, realizing that there is now a constructive job to do.

New markets are opening up, he continued, and when backward industries begin to see the necessity for more mechanism rather than less, there is bound to be the largest potential market that tool builders have ever seen.

Promotion Campaign Effective

The association's new marketing committee has been active promoting a better understanding of the machine tool and the industry. The study made last year by the National Industrial Conference board has proved of inestimable value and the association's publicity campaign based principally upon this report has practically eliminated the former very real prejudice against the machine, reported Mr. MacLeod.

Social security acts will add greatly to already heavy burdens, he asserted. While the effect will not be great this year, it may reach disturbing proportions. The pyramiding effect of payroll taxes on materials purchased for use in machine tool products is a factor about which one can only guess, yet if these burdens are not anticipated, trouble lies ahead. It has been estimated, said Mr. MacLeod, that costs of some of these items which require several processing operations may be increased as much as 15 to 20 per cent.

Other legislation, either now in effect or about to be, will place added burdens on tool builders, and, if neglected, these new expenses will soon eliminate the necessity of

Awarded for Action

EFFORTS for the revival of sales won this brass medalion for the National Machine Tool Builders' association. As reported in STEEL, *May 4, page 36, the award was made to Herman H. Lind, general manager of the association, by the American Trade Association Executives at its semiannual meeting in Washington, April 28. The concerted, two-year drive by the machine tool builders to create more favorable business conditions won praise from Secretary of Commerce Daniel C. Roper, who made the presentation*

worrying about "undistributed" earnings, he warned.

Added burdens have been placed upon the industry by demands for accuracy. Not many years back, he pointed out, 0.001-inch was considered close tolerance. Then mass production in the automotive field demanded closer accuracy, and 0.0005-inch became the vogue. Now, 0.00025-inch is considered an every day occurrence with many tolerances ranging from 0.0001-inch down to practically nothing. This means expense. Help must be more carefully selected and trained, inspection must be costlier both in time and equipment, and machines and tools must be up-to-date and the finest money can buy.

Additional burdens have been placed upon business through the ravages of depression, piling up of public debt, and the long-term prospect of how to liquidate these debts, Mr. MacLeod continued. Business men must take an active part in the solution of these problems, and this means contributions to trade associations, civic organizations, and out-of-pocket expenses of top executives, as well as loss of their time while they are working on these problems. On this point he said:

Business Men Must Advise

"A large proportion of the acts passed by local, state and federal governments, directly affects each man's business. Government needs and must have the sound judgment of responsible executives and trade associations. We must not shirk this responsibility, but it is going to be a factor in expense. We can choose between this burden or a far greater one which will surely come if we do not do our part in directing action and thinking along sound economic paths."

Concluding, he said: "Payroll taxes, while payable at the end of the year, run through the entire year and there must be money in the bank to pay them. Regardless of a profit or a loss for the year's operations, a very definite amount must be turned over to the government."

Speaking on the subject of "Labor Economics in 1936," Dr. H. L. McCarthy, dean, DePaul university college of commerce, Chicago, and former Chicago regional director of the national labor relations board, pointed out that the pending tax program will make big corporations stay big.

Labor in the machine tool industry is of a highly skilled class and is individualistic; unionism therefore is not its way out of difficulties, he said. Legislation on the shorter work week probably will be passed, but it is based upon a fallacious proposition and will not afford a remedy for unemployment.

In the opinion of Dr. McCarthy, industry has not yet scratched the surface of technical efficiency. As a solution to some of the economic ills, the speaker advocated the raising of price levels.

Discussing Dr. McCarthy's address, Ralph E. Flanders, president, Jones & Lamson Machine Co., Springfield, Vt., expressed the belief that raising price levels offers as many barriers as lower price levels. Unemployment is greatest, said Mr. Flanders, in the case of unskilled workmen; in occupations dependent upon agriculture; in the building trades where hours of labor are already too short; and in the transportation industries. In his opinion, one area in which prices must go down to stimulate buying and therefore increase employment is the field outside of staple goods.

Dr. Glenn Frank, president, University of Wisconsin, Madison, Wis., addressed nearly 200 attending the association's formal dinner, his subject being "Business and the Abundant Life." He defined "the abundant life" as requiring decent living wages and an adequate degree of security.

The speaker considered the trends in four types of government now in existence in the world, namely: Communism in Russia; Facism in Italy; Nazi or state socialism in Germany; and the New Deal in the United States. Instead of considering how these governments differ, he sought to show what they have in common.

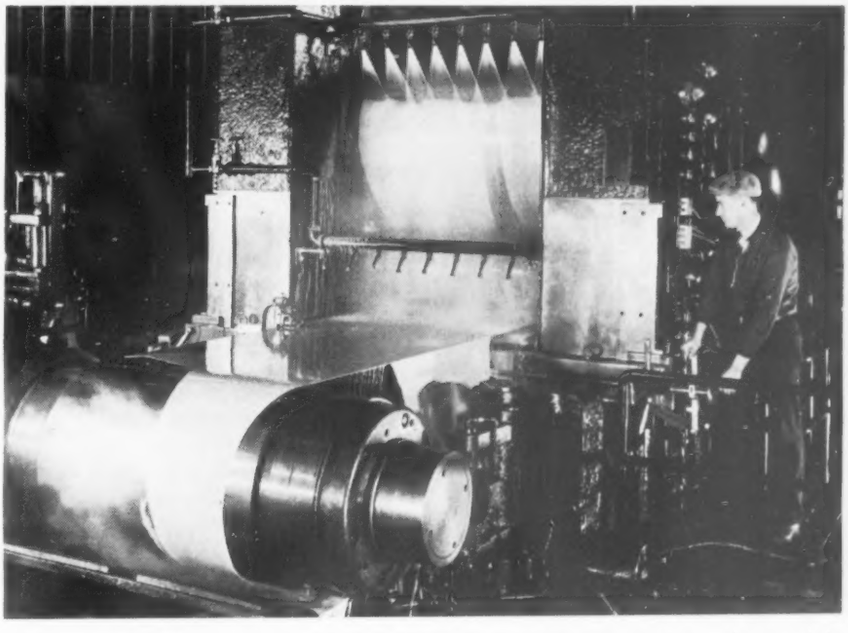
Two major points of likeness were pointed out by Dr. Frank as (1) political control of business and (2) centralization of power. The question to be answered is "what is the proper balance between political management and private enterprise?" The shift of power between politics and economics in the United States did not start with the New Deal but goes back some years, he said.

Fears National Suicide

"The present generation must determine to what degree politics can manage business," the speaker stated. "There is too much interference now. In determining the amount of political control, this generation faces the danger of driving America into national suicide if it accepts political leaders as receivers for American business enterprise."

The death of capitalism, as commonly publicized today, refers to "false" capitalism and not "true" capitalism, Dr. Frank asserted. False capitalism must be replaced by true capitalism which asks no guarantee

Ribbons of Steel at Dearborn



Glass-smooth rolls, enormous pressure, and accuracy measured in thousandths of an inch, are used in the new cold-finishing mills of the Ford Motor Co. to prepare sheet steel for manufacture into Ford V-8 bodies. This photograph shows the highly finished sheet steel coming out of the last stage of the mills. The workman is watching an automatic gaging device which may be seen at the left of the ribbon of steel. If the gage shows any variation from the proper thickness of metal he adjusts the rolls to correct it. The enormous energy expended in cold rolling generates so much heat that it is necessary to spray a cooling soda fluid over the metal. Since the recent start of production in the cold-finishing mills, the Ford Rouge plant at Dearborn, Mich., is now manufacturing automobile sheets through all the steps from the iron ore to the finished sheet, something done by no other automobile manufacturer

of earnings, is flexible, and is competitive. Through a short-sighted policy, the administration has fostered measures to guarantee profits; to maintain artificially high price levels; to provide special compensation for weak units; and to strangle fair enterprise.

For a solution, the speaker proposed that the people preserve the nation as a self-governing democracy; break the strangle hold on mass judgment; and manage to utilize rather than sabotize abundance.

To limit production and raise prices is reactionary and cowardly, Dr. Frank charged. Scientific and technical progress has given civilization the tools by which it is possible to abolish poverty, but the people seemingly lack the understanding and ability to utilize these tools.

Confronted with frequent inquiries for information concerning the distribution of machine tool sales, the association recently undertook the collection of statistics from member companies. Reporting upon this work at the closing session of the convention, Mrs. Frida F. Selbert, secretary of the association, Cleveland, pointed to several interesting trends in the expansion of certain fields and contraction of others. These shifts she explained as being caused by economic factors and the varying degrees of recovering in the different fields.

Will Expand Promotion

W. E. Whipp, president and general manager, Monarch Machine Tool Co., Sidney, O., presented the report of the marketing committee of which he is chairman. This committee is preparing to expand its publicity program and to augment it with an advertising campaign.

Speaking extemporaneously and at some length, Robert M. Gaylord, president, Ingersoll Milling Machine Co., Rockford, Ill., and the association's representative in the Machinery and Allied Products institute, reported on the activities of this body. This institute, representing organized and unorganized manufactures in the general machinery field, has been active in fighting objectionable federal legislation.

Although this report emphasized the distressing position in which machinery manufacturers find themselves in the eyes of the government, it was nevertheless encouraging for them to learn that a persistent and aggressive effort is being made to protect their interests.

Apprentice training was discussed in an address by W. W. Tangeman, vice president, Cincinnati Milling Machine Co., Cincinnati. He pointed out that a machine tool manufacturer should train apprentices numbering from 5 per cent of the total employment as a minimum up to 10 per cent or better.

Vacations with Pay Offered to 200,000

VACATIONS with pay or offers of additional pay in lieu of vacations will be given nearly half of the steel industry's 400,000 wage, tonnage and piece work employes this year, announcements from producers show.

The widespread movement is without precedent in the history of the industry. One estimate said $6,000,000 to $8,000,000 would be added to the annual pay rolls through the action.

Nearly 100,000 wage and tonnage workers in the iron and steel producing subsidiaries of the United States Steel Corp. will benefit by the Corporation's decision to offer a week's vacation with pay to all such employes affiliated with the Corporation for five years or longer. The cost, it was estimated, will be about 1.5 per cent of the pay rolls of the companies affected.

This is the first time the Corporation has extended vacations with pay to this class of workers.

Wage earners in the plants of the Bethlehem Steel Co. and the Bethlehem Shipbuilding Corp. Ltd., will be given vacations with pay also, under arrangements developed late last week between employe representatives and the management.

An announcement said "the plan is inaugurated for the year 1936 and is effective immediately. It provides for a week's vacation with pay for present hourly, piece rate and tonnage workers having five years' of continuous service."

About 30,000 employes in the manufacturing departments of Republic Steel Corp. and its subsidiaries will be given the choice of vacations with pay, or if they prefer to work, the opportunity to collect their vacation pay during the week preceding Christmas, plus interest. Workers on hourly, tonnage or piece work rates with a continuous service record of five years prior to Dec. 31, 1935, will be eligible.

Inland Steel Co. adopted a vacation plan last year which provides for time off in periods up to two weeks, depending on the length of employe service.

Youngstown Sheet & Tube Co. will follow a similar practice inaugurated for its hourly employes.

In the Pittsburgh and Aliquippa works of the Jones & Laughlin Steel Corp. between 10,000 and 12,000 hourly, tonnage and piece work employes with at least five years' continuous service, will be offered vacations with pay. The management granted a petition which had been transmitted through employe representatives several months ago.

Wisconsin Steel Co. has been giving its workers vacations with pay for several years.

Details of the various plans are still being worked out.

Steel Research Budget Raised to $9,200,000

EXPENDITURES for research work in the steel industry in 1936 will reach the highest total of any recent year and will exceed 1929 by almost 6 per cent.

An inquiry by the American Iron and Steel institute covering 42 companies, comprising nearly 90 per cent of the steel capacity of the industry, shows a combined research budget for the current year of $9,200,000. The total for the same group of companies was $8,100,000 in 1935 and $8,700,000 in 1929.

Research will be directed principally towards improving the quality of the industry's products, finding new markets and new uses for steel, developing new types of product and reducing cost.

The cost of research in 1935 amounted to about 37 cents on every ton of finished products produced by the 42 companies.

Facilities and equipment necessary for the steel industry's research program are valued in excess of $6,000,000. Nearly 2200 engineers, metallurgists, chemists, physicists and other technical experts devote their full time to research.

Approximately 40 per cent of the $9,200,000 which will be spent on research this year will be used in efforts to improve, the quality of the various products of the industry.

Steel Taxes Equal Wages for 57,360

TAXES equivalent to a full year's pay for 57,360 employes were paid by the American steel industry in 1935, according to the American Iron and Steel institute. For each of the 547,112 employes on the industry's payrolls last year, the tax bill was equal to $133, or over five weeks' pay.

During the year a total of almost $73,000,000 was paid in taxes to federal, state and local governments by the industry.

These figures were based upon information reported to the institute

by 127 companies which in 1935 produced more than 90 per cent of the total output of finished steel in the country. The figures indicate that the industry's tax bill in 1935 was approximately 16 per cent greater than that for 1934, largely reflecting increased payments of federal income taxes in accordance with improvement in earnings.

Taxes paid by the 127 companies were larger by a substantial margin than their earnings, which were only $62,961,961. Moreover, taxes were nearly double the total of $38,926,401 paid by those companies in dividends to their stockholders.

The year's tax total was equivalent to $132 for each of the industry's 551,832 stockholders. Dividends actually paid last year averaged $71 per stockholder.

Although tax payments are not available for all of the 127 companies prior to 1935, 26 of the companies, representing a major part of the total output, had a total tax bill from 1929 through 1935 aggregating $455,718,339.

Approximately 4.6 per cent of the companies' gross sales and earnings, which have aggregated $9,809,000,000 since 1929, has been paid out in taxes over the seven-year period. Taxes per ton of finished steel produced have amounted to $3.38 over the period.

Mechanization for Mines Is Lauded

OFFICIALS of the American Mining congress, in session in Cincinnati last week, claimed the attendance of more than 5000 delegates and visitors was the largest in history of the organization. A comprehensive display of mining machinery was an attraction.

Many speakers dealt with the subject of mechanization, contending that lowering of costs means prosperity for mine owners and operators, with better pay and increased employment in the mining, manufacturing and transportation industries.

These officers were chosen for the manufacturers' division of the Congress:

Chairman, Burton G. Shotton, Carbondale, Pa.; vice chairmen, William E. Goodman, Chicago; R. L. Cox, Columbus, O., and Frank E. Mueller, Chicago. New members of the board of governors: C. B. Officer, New York; L. W. Shugg, Schenectady, N. Y.; J. C. Wilson, Mansfield, O.; Frank E. Mueller, Chicago; Charles C. Whaley, Knoxville, Tenn.; and G. E. Stringfelloe, West Orange, N. J.

Mill Supply and Machinery Men "In Best Position"

NEVER has the position of mill supply and machinery distributors in this country been better than at the present time, said numerous speakers at the triple convention of the National Supply and Machinery Distributors' association, the Southern Supply and Machinery Distributors' association and the American Supply and Machinery Manufacturers' association, in Atlantic City, N. J., May 11-13.

Featured by an unusually large attendance and by an underlying tone of optimism as to the future, the proceedings revealed that great progress has been made in manufacturer-distributor relations and that the distributors have developed greater effectiveness in serving industry.

"The depression served a useful purpose in eliminating tendencies toward smugness and in promoting cooperation between manufacturers and distributors," said Carl A. Channon, Great Lakes Supply Co., Chicago. "The mill supply jobber is a necessity," said R. H. Dick, president, Barrington Associates Inc., New York.

"The industrial distributor is the economical method of distributing our product; we would have closed our doors in 1932 had it not been for the distributor salesmen," said L. M. Knouse, Stanley Electric Tool Co., New Britain, Conn., and president of the American Supply and Machinery Manufacturers' association. These are representative of expressions heard at the convention.

Urge New Sales Policies

Considerable emphasis was placed on the need for sales policies on the part of manufacturers who sell through distributors. The retiring president of the National Supply and Machinery Distributors' association, John T. Potts, Galigher Co., Salt Lake City, Utah, urged that manufacturers formulate and adopt policies which would enable distributors to function at a profit and enable them to assume risks which the manufacturers were not prepared to assume. The manufacturer would do well to regard the distributor as an integral part of his organization; to have one distributor in a territory, and to avoid competing unfairly against his distributors. Policies which protect the distributors, said Mr. Potts, prove best for all parties concerned.

It is not enough for a manufacturer to formulate his policy, said R. H. Dick. He should announce it. Both manufacturers and jobbers should announce their policies publicly, preventing disputes which are costly and disagreeable.

Product coverage received much attention at the convention. In an extended paper on the subject, Carl A. Channon declared that a line of products must be profitable to the jobber in order to deserve coverage. Because conditions vary so much for different territories and different products, no standard coverage for products can be set up. In each case the coverage must be studied from the standpoint of the cost, the profit, the demand and the potential demand.

Mr. Channon and other speakers described systems which they follow to determine their product coverage. All agreed that because different products compete against each other for the distributor salesmen's attention, it is essential that the salesmen be taught the uses and possibilities of the products.

Favors Questionnaires

C. Vance Boyd, Standard Shannon Supply Co., Philadelphia, said he gets valuable results from written questionnaires from manufacturers in connection with their products. These questionnaires are discussed at educational sales meetings and the answers are forwarded to the manufacturers who correct or modify the answers thus submitted. This method, endorsed by other speakers, is found to impress the salesmen much more effectively than results when they are taught by direct mail or by the lecture method.

Possibilities for increasing greatly the effectiveness of distributor salesmen lie in visits from manufacturers' representatives, it was agreed. In many cases at the present time, it was indicated, these visits have been improperly planned and not followed up effectively. A number of speakers held that such visits preferably should be made by men of the sales manager type, who could spend their time wisely in the field with one or more of the distributor salesmen rather than in the distributor's office or store.

Carefully planned visits by factory men are of great assistance to the

jobbers, in the opinion of G. U. Hatch, Millers Falls Co., Greenfield, Mass. They are costly, however, so that every care is necessary in order to justify the expense. It is desirable that the distributor give the factory man an order to take back home with him, since such business is regarded as a direct justification of the expense. The item of cost in sending out factory men also was mentioned by Mr. Knouse; he declared that the expense does not warrant sending men into territories where the volume of business is small.

Robert S. Page, Henry Walke Co., Norfolk, Va., places products under two classifications, one including the products about which little special knowledge is required and the other the more specialized products. He reported exceptionally good results from training men in the specialization of such products. He has had some of these men trained in the plants of the manufacturers of these products.

Outlines Sales Planning

The demonstration method of selling was mentioned by Andrew G. Carey, Carey Machinery & Supply Co., Baltimore. This method is good when it is of a character to arouse the enthusiasm of the salesmen, he said, but suffers from disuse when the salesmen do not like it. Mr. Carey described in considerable detail his company's method of planning its sales. This included setting a sales quota for each product and informing salesmen about the quota and what would be required of them.

In reference to encouraging the spirit of initiative in salesmen, Howard E. Torrell, sales manager of the Syracuse Supply Co., Syracuse, N. Y., said, "Reversing the usual order, we try to make sales managers out of our salesmen. We place the responsibility on them and then do all we can to back them up and help them." Mr. Torrell suggested that some of the industry groups well might follow the example of the Power Transmission council in educating salesmen and customers with respect to the possibilities of their products. As a case in point, he cited the electrical tool industry as susceptible of advancement through such co-operative educational work.

The best approach in enlisting the enthusiasm of distributor salesmen, said P. J. Callaghan, General Refractories Co., Philadelphia, appears to lie in a recognition of the fact that these salesmen usually are compensated on a bonus basis. The manufacturer will find it a big help, therefore, to convince the distributor salesman that he will profit from selling that manufacturer's product.

An abuse by manufacturers was cited by Robert H. Russell, J. Russell & Co., Boston. Certain nationally known manufacturers, he said, give lower prices to chain stores and mail order houses than to mill supply and machinery distributors. Such a policy cools the enthusiasm of the distributors, said Mr. Russell.

No high opinion for the direct-mail and sales literature put out by the manufacturers exists among the distributors, according to remarks at this convention. George C. Ruby, George F. Motters Supply Co., York, Pa., declared that his salesmen simply do not have time to read all the literature that the manufacturers send them on their products. Harry E. Ruhf, Cleveland Tool & Supply Co., Cleveland, said a lot of this sales literature goes into his company's waste baskets unread. "We do not want much literature; we want to have the manufacturers sell us so that we can sell our customers," said Robert S. Page. Sales literature must be interesting and nontechnical, said J. H. Hayden, Hewitt Rubber Corp., Buffalo. He said he finds such literature effective when it informs the salesmen where they can look for business in the company's products.

Considerable discussion was given the subject of territory coverage. In a detailed report of the methods by which his company's sales are handled, P. Ridings, Syracuse Supply Co., Syracuse, N. Y., declared that a distributor is not justified in going too far afield for business. A record kept by the company shows clearly that the cost rises as the distance covered increases, so that it is best for a company to focus on the development of business in its natural territory. Observance of this principle by distributors generally, said Mr. Ridings, tends to promote stability in the industry.

Richard Alcott, Reichman Crosby Co., Memphis, Tenn., declared that his company employs enough salesmen to make it possible to call on each customer at least once a month and the company finds it gets good results by compensating its men on a bonus basis. Ray C. Neal, R. C. Neal Co., Buffalo, described a simple book-keeping system for controlling sales effort. Cards with correctly placed tabs show the customers who have stopped buying. The system reveals quickly when the sale of any given product lags.

It is not entirely up to a manufacturer, in all cases, to see that the distributor makes a profit, said Z. B. Hampton, Fairmont Supply Co., Fairmont, W. Va. Rather, it is up to the jobber to make a profit by functioning efficiently and keeping down his selling expenses.

Two representatives of the Southern Supply and Machinery Distributors' association, F. M. Archer, Superior-Sterling Co., Bluefield, W. Va., association president, and T. W. Lewis, Lewis Supply Co., Memphis, Tenn., said the policy of being "a good neighbor" would help eliminate much of the confusion in distributor-manufacturer relations, and help improve conditions in the competition between distributors.

Catalogs Soon Obsolete

E. S. Grant, Dodge Mfg. Co., Mishawaka, Ind., in a discussion of better sales promotional methods by distributors, drew a line between what the manufacturers and the distributors should do. The manufacturer should prepare suitable catalogs and sales literature and advertise his product in the proper trade and business publications, he said, while the job of the distributor is to sell the product. Under no circumstances in these days is a jobber justified in publishing a catalog of his complete lines, he said, since usually such catalogs are obsolete soon after they are printed.

Election of officers to serve during the ensuing year preceded the adjournment of the convention.

G. H. Halpin, general manager, Minnesota Mining & Mfg. Co., St. Paul, is the new president of the American Supply and Machinery Manufacturers' association. Roger Tewksbury, Oster-Williams Inc., Cleveland, is first vice president and W. A. Purtell, Holo-Krome Screw Corp., Hartford, Conn., second vice president; E. S. Grant, Dodge Mfg.

New Methods Lengthen Steel's Life to 32 Years

PROGRESS in manufacturing, fabricating and preserving steel has steadily added to its life, so that the average useful service of the steel used in this country is now more than twice as long as it was 50 years ago.

The 34,000,000 tons of steel produced last year may be expected to last an average of 32 years, the American Iron and Steel institute has calculated. In contrast, the output in 1885 of less than 2,000,000 tons of steel, probably served an average of about 15 years.

Among the advances in steel manufacturing technique which have been most important are the development of alloy steels; improved processes for coating steel products with tin and zinc and other materials which are much more resistant to corrosion; development of rust resisting paints, enamels, lacquers and other coatings for steel, both decorative and utilitarian; and refinements in steel manufacturing processes and the rigid tests which steel products must pass before leaving the mills.

Co., Mishawaka, Ind., treasurer; Herbert Ladds, vice president, Lamson & Sessions Bolt Co., Birmingham, Ala., chairman of the executive committee; R. G. Thompson, vice president, Lufkin Rule Co., Saginaw, Mich., and Thoms Robins Jr., vice president, Hewitt Rubber Corp., Buffalo, elected to the executive committee for three years.

The National Supply and Machinery Distributors' association elected as its new president P. Ridings, Syracuse Supply Co., Syracuse, N. Y. Russell C. Duncan, R. C. Duncan Co., Minneapolis, was elected first vice president and W. T. Ryan, Cutter, Wood & Sanderson Co., Cambridge, Mass., second vice president. C. A. Channon, Great Lakes Supply Corp., Chicago, P. G. Maddock & Co., Philadelphia, and H. B. Waterman, Hendrie & Bolthoff Mfg. & Supply Co., Denver, were re-elected to the executive committee.

C. A. Dillon, Dillon Supply Co., Raleigh, N. C., was elected president of the Southern Supply and Machinery Distributors' association. R. S. Page, Henry Walke Co., Norfolk, Va., was elected first vice president and J. B. Dale, Briggs Weaver Machinery Co., Dallas, Tex., second vice president.

F. M. Archer, Superior-Sterling Co., Bluefield, W. Va., the retiring president, was elected chairman of the executive committee. Other members of the executive committee are T. W. Lewis, Lewis Supply Co., Memphis, Tenn.; Edward F. Stauss, Oliver H. Van Horn Co., New Orleans; and Walter S. Blun, Georgia Supply Co., Savannah, Ga.

Amalgamated Spurns Lewis' $500,000; Plans Vertical Organization Campaign

INDUSTRIAL unionism won the indorsement of the Amalgamated Association of Iron, Steel and Tin Workers in Canonsburg, Pa., last week, but delegates reserved the right to manage their own membership campaign and did not formally accept John L. Lewis' offer of a $500,000 contribution toward the reorganization drive.

Whether the action held promise of an intense union struggle and a new era in attempts to organize the steel industry was uncertain. Developments appeared likely to come from a meeting this week between Michael F. Tighe, 78-year-old president of the Amalgamated and members of the Amalgamated's international executive committee "to carry out the express will of the convention." The session will be held in Pittsburgh.

The 53-to-31 vote in favor of reorganizing along the lines of industrial unionism proved a basic victory for Mr. Lewis. The 84 delegates invited both national and international unions to co-operate through furnishing money and organizers and favored the creation of a joint committee on which national unions contributing would be represented.

Unionists interpreted the Amalgamated's action as one of its major steps in the last 20 years. Attempts to organize the steel industry gained impetus in 1933 with the advent of the steel code and the right of collective bargaining through Section 7-A. Fourteen years earlier, after the end of the World war, leaders headed by William Z. Foster made a determined effort toward organization.

Mr. Tighe said the resolutions adopted by the delegates last week "Clearly preserve and maintain the autonomy, jurisdictions, charter rights and traditions of the Amalgamated."

The following section was the one seeking to transform the Amalgamated into an industrial union:

"Any and all rights or claims of jurisdiction in the steel industry be permanently waived by any and all interested organizations in favor of the Amalgamated association."

The final act of the convention was to select Chicago for the 1937 meeting. New officers will be elected by mail ballots in July and August.

Franklin Institute Chooses Medalists

FRANKLIN institute, Philadelphia, will formally present 1936 medal awards at its medal day exercises, May 20, to the following:

Dr. Alfred V. deForest, president, Magnaflux Corp., New York, and Maj. William E. Hoke, consulting engineer, Baltimore, "In consideration of the new application of certain long-known principles to fill the need for a ready means of detection of hidden defects, primarily at or near the surface of magnetic materials, and of the development of means for the commercial application of this method to present day engineering problems."

Peter P-G. Hall, president, Hall Planetary Co., Philadelphia, "In consideration of his invention and development of machine and cutters for planetary milling and threading."

Albert L. Marsh, president, Hoskins Mfg. Co., Detroit, "In consideration of the contribution of a material which has proved of extreme importance to the electrical industries."

Dr. Joseph Becker, Koppers Construction Co., Pittsburgh, "In consideration of his improvements in the art of carbonization of coal and manufacture of gas in coke ovens, and particularly for his work in the development of the oven known as the 'Becker Oven'."

Dr. Charles Franklin Kettering, vice president and director, General Motors Corp., Detroit, "In recognition of his significant and timely contributions to the science of automotive engineering, a science out of which has grown the greatest industry in this country, the manufactured product of which has, in only a quarter of a century, changed the face of the civilized world."

Wins Contest on Bridges

Clarence H. Rosa, a University of Michigan student, won first prize in the eighth annual bridge design competition held by the American Institute of Steel Construction. A. W. Millington, a student of Rensselaer Polytechnic institute, won second prize. First honorable mention went to Russell E. Madsen of Rensselaer and second and third honorable mentions, respectively, to John A. Grove and Frank R. Streba of Carnegie Institute of Technology.

The problem was to design a steel highway bridge having a span of 300 feet, with 30 feet minimum vertical clearance over a river. First prize was $100 cash and second prize $50.

Poster Boosts Foreign Trade

Bureau of foreign and domestic commerce, Washington, which is cooperating in the second annual celebration of national foreign trade week May 17-23, is broadcasting a four-color poster entitled "World Trade Benefits All," with a picture of balanced scales signifying balanced trade superimposed on a phantom world map.

Scrap Board Meets May 27

Directors of the Institute of Scrap Iron and Steel will meet at the Commodore hotel, New York, May 27, the day prior to the spring meeting of the American Iron and Steel institute.

Production

STEELMAKING held unchanged last week at 68½ per cent, reflecting steady schedules at Chicago, eastern Pennsylvania, Youngstown, Cleveland, Birmingham, Detroit and Colorado. Pittsburgh boosted operations last week, due to demands for deliveries from steel consumers, and Buffalo rose 2 points to 75 per cent, a five-year peak for this district, but these gains were offset by losses at Wheeling, New England and Cincinnati. Further details follow:

Youngstown—Firm at 76 per cent last week, with expectations of a rise to 77 per cent at this week's start. Demand for flat steel from a wide variety of sources continues to surprise mill operators in this district.

Pittsburgh—Up 1 point to 63 per cent last week, due to the more insistent demands of consumers for deliveries. Steel mills here have at least the heaviest backlogs in six years, barring late June, 1934, and should continue to produce at above even 55 per cent until at least late June. Finishing mill schedules continue to be led by tin plate at 95 per cent, followed by sheets at 70, strip at 55-60, tubular products at 50, with structurals and plates at around 40 per cent.

Thirty-five steelworks blast furnaces are in operation. Carnegie-Illinois has 16 out of 32 on; Jones & Laughlin, 8 of 11; Bethlehem, 5 of 7 at Johnstown, Pa., National Tube, 3 of 4 at McKeesport, Pa., and American Steel & Wire, Pittsburgh Crucible, and Pittsburgh Steel, each 1 of 2.

Wheeling—Down 3 points to 89 per cent last week, following three successive weeks of unchanged production at 92 per cent. Thirty-three open hearths are now active, compared with 34 a week ago.

Detroit—Steady at 94 per cent last week, as 16 out of 17 open-hearth furnaces were in operation in the two districts works.

Cleveland-Lorain—Unchanged at 75½ per cent. Republic Steel Corp., which in the preceding week reduced its active open hearths from 12 to 9, added one unit, to operate 10, its week's average being about the same as before. Otis Steel Co. continued to operate 8, and National Tube Co., Lorain, 11. Republic is operating all of its four blast furnaces; Otis, both its stacks; National, three out of five.

New England—Down 1 point to 77 per cent, with indications that this rate will be maintained this week.

Chicago—Unchanged at 71 per cent for the third consecutive week. This is the peak rate for the year to date and although further increases are regarded as unlikely, backlogs and the current rate of business point to no more than a gradual decrease before the end of this quarter. Blast furnace schedules are steady with 24 of 41 stacks active.

Cincinnati—Down 4 points to 80 per cent, as one open hearth was taken off production, leaving 19 in the district active. All production is on light rolled material. Same schedule is anticipated for this week.

Birmingham—Fifteen open-hearth furnaces continued active last week, holding the steelmaking rate at 69 per cent. Rail rolling is still under way and steady demand comes from structural and plate fabricators.

Buffalo—Up 2 points to 75 per cent last week. Rush to get out material for shipment by lake and rail continues and scarcely any slackening of demand has been noted. Twenty-eight openhearths are in production, and tentatively scheduled to operate this week.

Central eastern seaboard—Steady at 44½ per cent last week, with little change indicated for this week.

Colorado—Colorado Fuel & Iron Corp., Denver and Pueblo, Colo., continued with 12 furnaces in production last week, averaging 75 per cent.

Steelmaking Operations

Percentage of Open-Hearth Ingot Capacity Engaged in Leading Districts

	Week ended May 16	Change	Same week 1935	Same week 1934
Pittsburgh	63	+ 1	38	51
Chicago	71	None	51½	64
Eastern Pa.	44½	None	28½	45
Youngstown	76	None	50	62
Wheeling	89	— 3	73	74
Cleveland	75½	None	51	78
Buffalo	75	+ 2	32	66
Birmingham	69	None	54½	53½
New England	77	— 1	50	84
Detroit	94	None	94	100
Cincinnati	80	— 4	†	†
Colorado	75	None	†	†
Average	68½	None	45½	59

†Not reported.

U. S. STEEL CORP. SHIPMENTS

(Inter-company shipments not included)

(Tons)

	1936	1935	1934	1933
Jan.	721,414	534,055	331,777	285,138
Feb.	676,315	583,137	385,500	275,929
March	783,552	668,056	588,209	256,793
April	979,907	591,728	643,009	335,321
4 mo.	3,161,188	2,376,976	1,948,945	1,153,181
May		598,915	745,063	455,302
June		578,108	985,337	603,937
July		547,794	369,938	701,322
Aug.		624,497	378,023	668,155
Sept.		614,933	370,306	575,161
Oct.		686,741	343,962	572,897
Nov.		681,820	366,119	430,358
Dec.		661,515	418,630	600,639
Yearly adj.			19,907	44,283
Total		7,371,299	5,905,966	5,805,235

CORP. SHIPMENTS UP SHARPLY

Shipments of finished steel by the United States Steel Corp. in April were 979,907 tons, a gain of 196,355 tons over the 783,552 tons shipped in March. This is the largest month's shipments since June, 1930, when the figure was 984,739 tons. For four months of 1936 shipments total 3,161,188 tons, compared with 2,376,976 tons in the corresponding period of 1935.

Irvin Sees Steel-Oil in New Era

A TRIBUTE to the co-operative progress of the steel and oil industries was given by William A. Irvin, president, United States Steel Corp., at the opening of the ninth international petroleum exposition in Tulsa, Okla., May 16. He expressed the hope that the two industries will continue to go forward together into a new era.

"We of the steel industry derive some satisfaction from the knowledge that our products have lent a progressively helping hand to the petroleum industry in the attainment of its present goal," said Mr. Irvin.

"The difficulties of lifting oil from great depths have been overcome by the engineering forces of the oil industry, and with their help, the research and engineering forces of the steel industry have been able to meet the requirements in products of steel which have had to take increasingly heavy stresses, with many other conditions incident thereto.

Adaptability of Steel

"The refinery branch of your industry has taxed the resources of the steel metallurgists, and we like to think that we have been able to keep pace with your requirements for stronger steels, for steels strong at high temperatures and for steels resistant to corrosion. Your requirements have been a stimulant to our metallurgists in the development of special purpose steels that will find use in many other industries.

"The resources of engineering, metallurgy, chemistry, and the allied sciences have been used unreservedly to produce steel properly adapted to the severe and diversified requirements of the oil field, pipe line, refinery, and media of distribution. It is a far cry from the few simple grades of steel and iron of the 1860's to the rather formidable list of carbon and alloy steels of the present day, but we are striving to keep in step with the rapid pace set by our

friends who are depending upon us for new and better materials.

"In all phases of the oil business we see a persistent urge toward a continual improvement of ordinary methods. There is also a determined effort to devise and adopt procedures which bring about major changes in the outlook.

"We learn that not only are new processes for breaking down petroleum, such as cracking, in successful operation, but that synthetic processes for building up certain products are yielding to the ingenuity of your technologists.

"So all-pervading has the spirit of analysis and synthesis become that even a customer of the oil industry, stopping at a filling station, is made aware of the fact that the price of gasoline is composed of three major constituents, specified as the stipulated price, plus federal and state tax.

"Herein resides one of the troublesome factors affecting industry today. Unfortunately the tried and true measures of inventiveness and efficiency seem sometimes almost unavailing against the burdens of excessive taxation. Such problems require external treatment by remedies which lie beyond the limits of these remarks.

New Markets Opened

"Thus far we have emphasized, as befitting this occasion, the happy and mutually advantageous interplay of effort within one pair, oil and steel; however we know that the situation is strengthened by the addition of other related groups.

"Internal combustion engines in motor vehicles, airplanes, ships, homes, and factories have opened up new markets to both oil and steel.

"The oil burner in a dozen different fields surpasses the kerosene lamp and other past consumers of certain fractions of petroleum. Road building is a many sided activity that has meant much to our respective interests, as well as to others. Solvent naphtha and lubricating oil are in demand as never before, on account of new and expanding requirements in various lines of manufacture.

"Having traveled the road thus far together, may we continue along this highway of co-operation, facing new problems, overcoming obstacles, working as a unit to keep American industry at the head of the procession. Our industry gains by the progress in your own.

"I would be remiss were I to close without acknowledging the contribution that your products, in their various forms, have made to our own developments. Many of our new mills could not have been designed and operated without the development of better lubricants by your chemists and engineers."

Labor

WHEELING STEEL CORP. has been ordered by national labor relations board to withdraw all recognition from departmental councils and the general council as representative of its employes, in dealing with the company concerning wages and shop conditions at its Portsmouth, O., plant.

From evidence given at hearings held both in Washington and Portsmouth, the board said it found that the councils were initiated and controlled by the Wheeling company to discourage membership in the Amalgamated Association of Iron, Steel and Tin Workers.

The board ordered the company to "end its interference with the affairs of the five amalgamated lodges existing in its plants." William Patton, a discharged worker, was ordered reinstated with back pay.

"The posting of notices, announcing the disestablishment of the councils, and a termination of company interference with the amalgamated lodges, is ordered for a period of 30 days," said the board.

First Quarter Steel Output Made for Sale

Compiled by American Iron and Steel institute from reports by 185 companies; in comparable period of 1935, total production was 6,661,995 gross tons of steel products, with 45.1 per cent of capacity engaged

		Number of companies	Items	Annual Capacity Gross tons	First Quarter 1936 Gross Tons			
					Production for Sale	Per cent of capacity	Shipments: Export	Shipments: To members of the industry for conversion into further finished products
Steel Products	Ingots, blooms, billets, slabs, sheet bars, etc.	33	1	xxxxxxx	1,048,653	xxx	2,788	900,682
	Heavy structural shapes	9	2	5,280,720	426,604	32.3	11,162	-
	Steel piling	4	3	265,000	18,932	28.6	1,054	-
	Plates—Sheared and Universal	23	4	6,264,549	430,557	27.5	15,254	2,750
	Skelp	8	5	xxxxxxx	114,002	xxx	2,029	73,647
	Rails—Standard (over 60 lbs.)	5	6	4,105,000	268,824	26.2	2,422	-
	Light (60 lbs. and under)	6	7	775,820	21,291	11.0	6,225	-
	All other (Incl. girder, guard, etc.)	2	8	140,000	6,568	18.8	261	-
	Splice bar and tie plates	15	9	1,008,793	89,978	22.4	827	-
	Bars—Merchant	37	10	xxxxxxx	735,101	xxx	8,311	62,253
	Concrete reinforcing	28	11	xxxxxxx	162,334	xxx	3,717	-
	Cold finished—Carbon	17	12	xxxxxxx	129,915	xxx	703	-
	Alloy—Hot rolled	14	13	xxxxxxx	143,265	xxx	1,141	9,768
	Cold finished	13	14	xxxxxxx	14,979	xxx	29	-
	Hoops and baling bands	3	15	xxxxxxx	15,296	xxx	191	-
	TOTAL BARS	65	16	13,123,460	1,200,950	36.6	14,092	72,021
	Tube rounds	3	17	xxxxxxx	18,355	xxx	-	16,528
	Tool steel bars (rolled and forged)	10	18	110,320	7,946	28.8	32	-
	Pipe and tube—B. W.	10	19	1,829,928	134,910	29.5	3,781	-
	L. W.	11	20	1,739,534	87,735	20.2	2,108	-
	Electric weld	3	21	813,571	18,847	9.3	61	-
	Seamless	15	22	2,655,970	249,035	37.5	4,608	-
	Conduit	6	23	142,350	10,875	30.6	293	-
	Mechanical Tubing	6	24	217,450	21,379	39.3	725	-
	Wire rods	17	25	xxxxxxx	101,004	xxx	10,072	64,269
	Wire—Drawn	30	26	1,768,402	230,602	54.0	9,363	4,424
	Nails and staples	20	27	1,102,093	115,171	41.8	2,727	-
	Barb, fence, bale ties, fence posts, etc.	24	28	1,534,754	121,566	31.7	7,647	-
	Black plate	14	29	416,879	63,037	79.7	2,487	32,162
	Tin plate	18	30	2,559,356	412,872	64.5	82,999	-
	Sheets—Hot rolled	21	31	xxxxxxx	341,933	xxx	6,750	43,141
	Hot rolled annealed	23	32	xxxxxxx	301,701	xxx	10,271	1,185
	Galvanized	17	33	xxxxxxx	234,765	xxx	12,869	-
	Cold rolled	19	34	xxxxxxx	453,298	xxx	17,155	-
	All other	16	35	xxxxxxx	105,762	xxx	2,462	-
	TOTAL SHEETS	31	36	8,540,114	1,527,539	71.5	49,507	44,326
	Strip—Hot rolled	29	37	3,710,456	444,626	52.2	6,692	61,188
	Cold rolled	35	38	1,116,272	148,617	53.3	3,525	-
	Wheels (car, rolled steel)	5	39	398,284	24,670	24.8	130	-
	Axles	5	40	425,300	5,055	4.7	60	-
	Track spikes	11	41	350,260	25,352	29.0	319	-
	All other	5	42	20,907	2,970	56.8	869	-
	TOTAL STEEL PRODUCTS	159	43	xxxxxxx	7,526,774	xxx	247,129	1,271,997
	Estimated total steel finishing capacity based on a yield from ingots of 67.3 %		44	45,205,700	xxxxxxx	55.3	xxxxx	xxxxxxx
	Pig iron, ferro manganese and spiegel	29	45	xxxxxxx	1,171,313	xxx	560	312,438
	Ingot moulds	5	46	xxxxxxx	69,643	xxx	1,207	-
Iron Products	*Plates		47					
	*Skelp		48					
	Bars	15	49	240,019	13,960	22.4	225	255
	*Splice bars and tie plates		50					
	Pipe and tubes	4	51	213,153	11,305	21.2	37	-
	*Sheets		52					
	All other (Includes *)	5	53	151,900	13,205	34.8	183	703
	TOTAL IRON PRODUCTS (ITEMS 47 to 53)	19	54	556,172	38,470	27.7	445	958

Men of Industry

C. R. COX, formerly general superintendent of the Ellwood works of the National Tube Co., Pittsburgh, has been elected vice president in charge of operations and engineering, succeeding P. C. Patterson, who has held the position since 1926 and who had been with the company for 49 years.

Mr. Cox began his career at the Midland, Pa., plant of the Pittsburgh Crucible Co. in 1920, and five years later was named superintendent of the Park works, Pittsburgh, for the company. In 1930 he became associated with Babcock & Wilcox Tube Co., Beaver Falls, Pa., as superintendent, and in 1934 went with National Tube as assistant general superintendent of its Ellwood works. Last year he was named general superintendent of that division.

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Fred W. Hale has been appointed manager of the mechanical specialties sales department, Wickwire Spencer Steel Co., New York, succeeding the late J. R. Worsfold. Mr. Hale, who was graduated in 1925 from Stevens Institute of Technology, Hoboken, N. J., as mechanical engineer, had been in charge of the company's sales of mechanical specialties in the eastern territory for the past three years.

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Stanley A. Knisely, formerly manager of the advertising and sales promotion division of Republic Steel Corp., Cleveland, has been appointed director of advertising, with direct supervision of all advertising of the corporation and its subsidiaries.

Forrest H. Ramage has been promoted from assistant manager of the advertising and sales promotion division to sales promotion manager in charge of sales promotion activities. His work is in connection with the new product development division, headed by Julius Kahn, who recently resigned as president of Truscon Steel Co. to become vice president of Republic in charge of product development.

Forrest H. Ramage

Stanley A. Knisely

Chester W. Ruth, formerly assistant manager of the advertising and sales promotion division, has been named assistant director of advertising.

Mr. Knisely began his career in the steel mills near his home in Canton, O., but soon after entered the newspaper field as a cub reporter on the *Canton Daily News*. He became managing editor of that paper and from there went to the *Cleveland Plain Dealer* as telegraph editor, and later city editor. In 1920 he became affiliated with the National Paving Brick association as assistant secretary in charge of advertising. He was named director of research and advertising of the Flat Rolled Steel association in 1927, and in 1934 went to Republic as manager of the advertising and sales promotion division.

Mr. Ramage, a graduate of Michigan College of Mining and Technology, became associated with the Republic Iron & Steel Co. in 1926 as a sheet mill metallurgist. In 1927 he was assigned to the New York district sales office as sales engineer; in 1929, he was transferred to the Youngstown general office on the special development of Toncan iron pipe, and in 1931 was chosen assistant manager of the advertising and sales promotion division.

Mr. Ruth began his active association with steel advertising in 1920 with a Canton, O., advertising agency. In 1926 he joined the advertising department of United Alloy Steel Co., which was consolidated with the Central Steel Co. to become Central Alloy Steel Corp. Throughout the mergers he remained in the advertising department until 1930, when the company became a unit of Republic, and Mr. Ruth was chosen assistant advertising manager of the comporation.

♦ ♦ ♦

James P. Allen has been named vice president of the Machined Steel Casting Co., Alliance, O., and will be in charge of the company's Pittsburgh office at 1622 Oliver building. He formerly was president of the Union Steel Casting Co., Pittsburgh.

♦ ♦ ♦

James E. Nolan has been made purchasing agent for the Scullin Steel Co., St. Louis. Other appointments include Harry C. Dreibuss, who has been named chief mechanical engineer, and James Glover and R. C. Geekie, who have been added to the sales department.

♦ ♦ ♦

B. W. Steele, Denver, formerly in charge of dam design for the United States bureau of reclamation, has joined the Tennessee Valley Authority, Knoxville, Tenn., as chief design engineer for its various proposed dams, railroads, bridges, highways, etc.

♦ ♦ ♦

W. R. Ramsaur has been appointed chief engineer of the Young Radiator Co., Racine, Wis. Mr. Ramsaur received his schooling at Massachusetts Institute of Technology, and for the past seven years had been connected with another widely known radiator manufacturing firm.

♦ ♦ ♦

Charles T. Scannell, general manufacturing manager, Buick Motor Co., Flint, Mich., last week was tendered a testimonial dinner by executives of all Buick manufacturing divisions and the entire factory field executive personnel, marking the thirtieth anniversary of Mr. Scannell's connec-

Chester W. Ruth

tion with the company, during which he has climbed from a lathe hand in the first axle factory to the position of full responsibility for all Buick manufacturing. Harlow H. Curtice, president, presided at the function and paid glowing personal tribute to Mr. Scannell.

♦ ♦ ♦

R. M. Guiry has been appointed manager of the Chicago branch office and warehouse of the Kennedy Valve Mfg. Co., Elmira, N. Y., manufacturer of valves, pipe fittings and fire hydrants. Mr. Guiry has been connected with the Chicago office for the past nine years.

♦ ♦ ♦

Frank B. Powers has been appointed manager of the railway engineering department of the Westinghouse Electric & Mfg. Co., East Pittsburgh, Pa., to fill the vacancy caused by the recent death of Claude Bethel. Mr. Powers formerly was in charge of the design of Westinghouse d.c. traction motors.

♦ ♦ ♦

Arthur H. Peters has been appointed production manager of the American Ironing Machine Co., Algonquin, Ill., subsidiary of the Barlow & Seelig Mfg. Co., Ripon, Wis., maker of household washing machines. He has been engaged in the household washer and ironer industry 35 years.

♦ ♦ ♦

L. W. Grothaus, since 1932 assistant to the president, Allis-Chalmers Mfg. Co., Milwaukee, and associated with the firm nearly 30 years, has been elected a director of the company, continuing his present duties in connection with sales activities. He started with the Bullock electrical works at Cincinnati (Norwood), rising to works manager and then being transferred to the general offices in Milwaukee as assistant manager of the electrical department. He then was appointed general representative and later assistant to the president.

♦ ♦ ♦

F. A. Jensen, formerly sales manager for William H. Nicholls Molding Machine Co., has been appointed sales engineer for the National Engineering Co., Chicago, representing it in the Detroit territory. He assumed his new duties May 1. Serving his foundry apprenticeship in Denmark, he received his technical education there, and did further work in Scotland and Germany. In 1910 he received a diploma from the McClain System.

He has worked as a molder, coremaker, inspector, instructor, foreman, assistant superintendent and superintendent in various foundries in the United States. He also was engaged in foundry consulting work. During 1933 he represented the National Engineering Co., Pangborn Corp., William H. Nicholls Molding Machine Co., Smith-Myers Core Oven Builders, Cleveland, and Eastern Corp., New York, in Russia. He returned to America in 1935 and became associated with the William H. Nicholls company.

♦ ♦ ♦

D. Angus Currie, president, Erie Foundry Co., Erie, Pa., recently left this country for a two months trip to England.

♦ ♦ ♦

K. B. Walton has been appointed vice president and business manager of Fleetwings Inc., Bristol, Pa. W. L. Sutton has been made vice president and chief engineer in charge of sales of the company.

♦ ♦ ♦

William C. Baird, treasurer, Buffalo Pipe & Foundry Co., Buffalo, was high man among 18 contestants who sought election as directors of the Buffalo chamber of commerce for three-year terms. This is regarded as the highest honor that can be won in civic competition in this area. Also elected to similar terms were Ralph F. Peo, vice president and general manager, Houde Engineering Corp., and Joe H. Gardner, president of Bingham & Taylor Corp., foundry operator.

♦ ♦ ♦

G. E. Mahoney, formerly a sales engineer in the Milwaukee offices of the Chain Belt Co., has been moved to the Pittsburgh offices of the company at 526 Grant building. Mr. Mahoney has been connected with Chain Belt for a number of years and is well versed in the application of conveyors in industry. He has designed numerous plants, and although located at Pittsburgh, he will continue to specialize in this type of work.

♦ ♦ ♦

Sol Einstein has been elected a vice president of the Cincinnati Milling Machine Co., Cincinnati. Mr. Einstein started with the company in 1903 as a tracer. Becoming next a detailer and designer, he rose steadily until he reached the position of

(*Please turn to Page* 28)

Died:

ELMER E. WOODSIDE, 75, for 26 years master mechanic of the tube mills of the Youngstown Sheet & Tube Co., Youngstown, O., and retired for the past four years, at his home in Youngstown, May 2. Born in Lykens, Pa., he went to Youngstown as master mechanic from Middletown, Pa., when the American Tube & Iron Co. built a branch plant at Youngstown. This later was absorbed by the National Tube Co., and Mr. Woodside continued as master mechanic until 1906, when he became master mechanic for Sheet & Tube's tube mills.

♦ ♦ ♦

Arthur L. Tushbant, 39, president, Reliance Steel Corp., Detroit, in Detroit, April 29.

♦ ♦ ♦

Earl V. Hennecke, 52, president of the Automatic Equipment Co., Long Island City, N. Y., in Hoboken, N. J., May 11.

♦ ♦ ♦

Harold Clay Thompson, 44, experimental engineer for the Warner Gear Co., Muncie, Ind., in that city recently.

♦ ♦ ♦

Edward R. McIntyre, foreman of the Chevrolet Motor Co.'s gray iron foundry, Saginaw, Mich., at Flint, Mich., May 9.

♦ ♦ ♦

Frederick R. White, 64, president, Baker-Raulang Co., Cleveland, maker of industrial platform trucks, cranes and tractors, in Cleveland, May 14.

♦ ♦ ♦

Burton L. Delack, general assistant to vice president W. R. Burrows of the General Electric Co., Schenectady, N. Y., and until two years ago manager of the company's Schenectady works, in that city, May 7.

♦ ♦ ♦

James B. McKillips, assistant auditor of Carnegie Steel Co. until his retirement in 1931, and one of the company's "gold medal" employes with more than 50 years of continuous service, at Pittsburgh, May 10.

♦ ♦ ♦

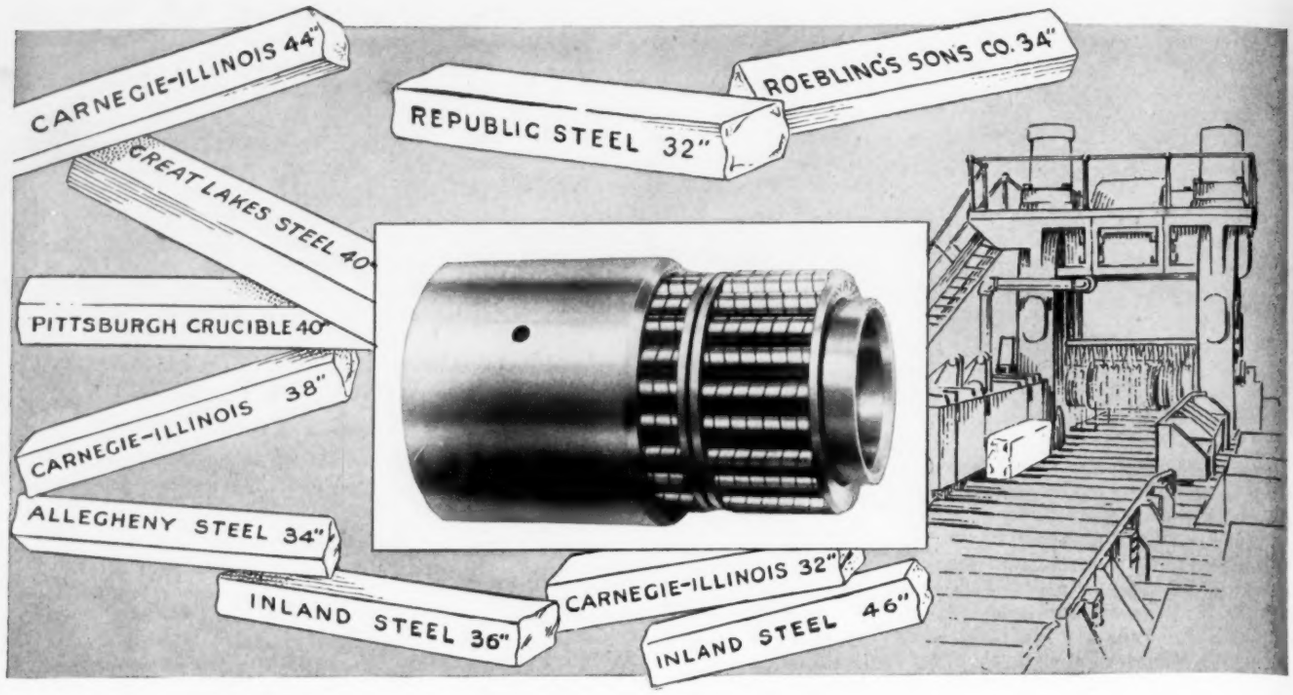
James D. Storie, 81, president, Fittings Ltd., Oshawa, Ont., March 29. Mr. Storie was born in Newcastle, Ont., and spent his entire life in that province. He founded Fittings Ltd. at Oshawa in 1902, and prior to that had been superintendent and manager for a number of years of the Ontario Malleable Iron Co.

♦ ♦ ♦

Charles J. Barnes, superintendent for 17 years of the Falcon Bronze Co., Youngstown, O., in that city, May 11. He formerly was employed by the United Engineering & Foundry Co. before going to the Falcon Bronze Co., and more recently was with the Republic Steel Corp. He had resided in Youngstown practically all his life.

♦ ♦ ♦

J. C. Van Doorn, former sales manager, Universal Atlas Cement Co., subsidiary of the United States Steel Corp., in Minneapolis, May 13. He began his work with the cement company in 1903 as sales agent at St. Louis, and in 1907 became sales manager at Minneapolis, which position he held until last October when he asked to be relieved of his duties under the pension plan of the company.



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H Y A T T

ROLLER BEARINGS

PRODUCT OF GENERAL MOTORS

Mirrors of Motordom

DETROIT

IT TURNED out to be a good thing that the automobile industry brought out its 1936 models when it did last November. If it hadn't, the industry would be running a real fever today to get out production.

For, barring the letdown old man winter gave in February, each month since last Thanksgiving has been a corker on assemblies. Had it not been for that toe-hold that last November and December gave, new car deliveries conceivably might be a month or two in arrears today.

As matters now stand, automobile output in May will be almost as good as that of April, both so close to 500,000 cars apiece that the difference will be negligible. May has therefore been a surprise; few in Detroit last March thought we could have two months in a row accounting for more than 900,000 and almost 1,000,000 new automobiles between them.

Regarding the short-term outlook, the trend guessers set June down as beating an orderly retreat from this April-May peak. July will be the 1936 low, August some better, the last four months of the year progressively up.

Quick Changeover Due

That July will be low seems fairly certain because that month will mark the beginning of the changeover to 1937 models. But that August will start the ball rolling again is remarkable from a time element. This year, more than any other in the last five or six, will see the quickest changeover of equipment for new models. In all, it should not take more than six weeks.

In more ways than one, motor makers by their actions today have confirmed this logic of dips and rises. Practically all of the machine tool buying for 1937 has been completed, and orders all have the tag of June 1, June 15 or no later than July 1 delivery.

General Motors has been consistently hewing to that line of setting a definite June date for machinery deliveries to its numerous divisions; so has Chrysler, and Ford to an extent. Die shops have heavy work at hand and have been working on this type of business so as to insure June, or, at the outside July, shipment.

To illustrate, some Detroit shops last week were in fairly-advanced stages on large die work for Hudson, Dodge, Chrysler, and others. Fisher, which has been doing much of its own work, is similarly progressed.

Advance Steel Orders Placed

Then in steel, too, does confirmation of the July swingover crop out. By last week, practically all of the "production" steel buying had been finished. By this is meant the blanket orders placed against a certain projected assembly (usually a month in advance) and a term usually associated with full-speed assemblies.

Of course, these orders have yet to be balanced by shipments against them for well into June. But the next steel purchasing the automobile industry will do will run to clean-up specifications.

This, doubtless first appearing late in May, will run to more individual items of widely varying tonnage. Orders will be motivated to balance inventories on 1936 steel sizes and to wind up the present run.

Along in June the first steel against 1937 cars will be bought. Preceded by trial sizes, general negotiating and long lists of item inquiries, this type of steel buying will be in full tilt by the start of the third quarter. Somewhat ahead of the procession is Studebaker, by last week already out with its 1937 steel inquiries.

To return to preparations for 1937 in the machine tool, die and small tool trades, so heavy has the call been for certain machine tools that a few of their makers—and this includes some large shops—are now unable to promise anything in the way of delivery for another year.

To go one step further, one large machinery manufacturer now is giving nothing but two-year shipping promises on a certain popular gear-making machine. This type of equipment, for turning out hypoid gears in rear axles, has been a big purchase item by Dodge and Chevrolet, just to name two. Their orders alone have been up in the hundreds of units. One order for gear cutting machines placed by a motor maker here recently was for over $600,000.

The Chrysler program for the East Jefferson plant has been a big one, and by now has all been allocated among machinery builders. Primarily it centers on equipment for two motor lines. Only one Airflow for 1937 will be built at the East Jefferson plant.

In addition to refurbishing the former LaSalle plant on Wyoming avenue here, as this department detailed two weeks ago, Chrysler has now decided on building an addition there. Requiring around 1600 tons of structural steel, it will house an up-to-date press shop and will be completed in time for 1937 manufacturing. Presses, cranes and the heavier items of equipment have all been bought recently.

Small Ford Holds Interest

The major stir at Ford is pretty well known in outside automotive circles— that the small type V-8 motor is again a matter of lively interest at Dearborn. The motor is, by and large, a trimmed-down version of the present V-8, has a single piece V block, smaller bore, smaller stroke and generally pared down dimensions.

It has some welding operations proposed where the transmission joins, but in other major respects is a true son of the present parent. This small motor is, however, to an entirely different specification than the small Ford motor that almost came out two years ago. Further-

Mirrors of Motordom

more, it is the result of an entirely different sequence of engineering test and development, even though the basic idea is the same.

But, though motordom has in some respects become excited over the prospect of another Ford motor change, there is no assurance that the small job will come to pass. No sales department approval has been given, nor has any come from the top Ford executives. In fact, the small job two years ago went even to a more advanced stage before it was discarded.

Until such decisions have been reached, the present project may simply be catalogued with a thousand and one other automobile mechanical changes that not only Ford but General Motors, Chrysler and the independents constantly work on.

One thing seems certain though, that the small V-8 is not to be confused with the present small motor made for England. It is a design for the domestic market, and in order to give the subject fair test a certain amount of retooling has been under way at the Rouge. Instructions are out to determine the extent of preparation necessary to make 160 finished small motors per hour.

Ford Traditions Going

In the final analysis, if Ford were to bring out a small eight, it very likely would be done to combat the heavy play on "economy" that Chevrolet and Plymouth, with their sixes, hit so hard.

The complications arising out of the small Ford seem evident. The Ford organization is extremely unlikely to have two V-8 motors in price proximity before the public at once, at least if Ford tradition of some thirty-odd years means anything. Those who comment on that fact that Ford has always merchandised one motor design at one time, are, however, met by the counter opinion that has seen the Lincoln Zephyr dropped in between Lincoln and Ford just in the past year, obviously a move at integration in more price fields, and clearly an amelioration of former inviolate principles.

Meanwhile, Ford's more immediate plans for the remainder of 1936 and which are really of a definite character, hinge on dressing up the present standard models on the V-8 series. An interior refurbishing will be done to narrow the appearance range between present standard and de-luxe V-8 jobs. New standard colors may be adopted.

Last week Ford's increase of two points in dealers' commissions was hailed as a big gun in the war for the low-priced car field's dominance. The move, which ups dealers' commissions from 22 to 24 per cent on passenger cars, obviously strongly entrenches Ford's field forces, will tend to increase dealer outlets, and also permit their more generous trade-ins.

This was the first change in Ford dealer commissions since 1931, when the percentage was stepped up from 20 to 22. Last week's announcement detailed that no change from 22 per cent on Ford trucks and commercials was being made, and that there was no revision in delivered, or f.o.b., car prices for either passenger or commercial models.

In reply, Chevrolet and Plymouth announced no change in their dealers' commission setup but got out of a further answer by explaining that dealers' commissions in their cases fluctuated from time to time because they included such as variant commissions on parts, etc.

To bring General Motors into the retooling discussion, the so-called "mystery plant" for which a wide lot of equipment has been bought for delivery June 1, now turns out to be for the start of an ambitious program on manufacturing automotive diesel engines.

Rather than build a new plant in Detroit, General Motors high command hit on the idea of setting aside manufacturing space in one of its present plants for the time being. The Cadillac-LaSalle division in West End Detroit has been finally decided on, so part of that plant will be set aside for making diesel engines for passenger automobiles on the largest scale by anyone yet in the automobile industry.

The finished job will be made there, and many of the parts will be produced there also, though some of the latter will be supplied from other General Motors' divisions, prominent among which will be the General Motors Research laboratories adjoining the General Motors building on Second avenue, Detroit.

Thus, the beginnings of what may be the most revolutionary development in the automobile industry since it started 40 years ago on the basis of a two-cycle gas-powered motor, are under way. Possibly by 1938, this work will bear fruit to the extent that one of General Motors' models at least will be so powered. It hardly seems likely at this writing that the new type of propulsion can be brought out much sooner than that.

Changes for 1937

Of course, on 1937 lines General Motors, like others, is by now pretty well squared away. Changes in brief, favor more streamlining for bodies, greater differentiation between outward appearances of Chevrolet, Pontiac, Olds and Buick, a vote for hypoid gears in rear axles, a vote for automatic transmission and a universal front as far as valve-at-side motors are concerned.

Such pioneering of former years as knee action and turret top will be retained, and in this connection it must be gratifying to General Motors to learn that Plymouth and Ford will also have the all-steel top next year.

One major reshuffle of General Motors subsidiaries is the possible favoring of Buick to the extent that a six-cylinder line might be dropped into its line. Buick has had plans for a six on its engineering boards and has felt keenly the Packard 120 in the field to the extent that it may plunge in and integrate, especially with the small Packard six coming out this fall to further sharpen competition.

Making sure of its ground, Pack-

(*Please turn to Page* 89)

Automobile Production

Passenger Cars and Trucks—U. S. Only
By Department of Commerce

	1934	1935	1936
Jan.	155,666	292,785	367,252
Feb.	230,256	335,667	290,964
Mar.	338,434	429,793	424,571
Apr.	352,975	477,691	*505,000
4 mo.	1,077,331	1,535,936	1,587,787
May	330,455	364,662	.....
June	306,477	361,248	.....
July	264,933	336,985	.....
Aug.	234,811	239,994	.....
Sept.	170,007	89,804	.....
Oct.	131,991	275,024	.....
Nov.	83,482	398,039	.....
Dec.	153,624	407,804	.....
Year	2,753,111	4,009,496	.....

*Estimated.

Estimated by *Cram's Reports*

Week ended:	
May 2	118,764
May 9	118,786
May 16	117,156

PRODUCTION NOTES

CADILLAC'S traditional selection of the very best for its assembly, includes the fastening details for its renowned insignia on both louvers. These plates must draw-up perfectly flush and remain permanently tight . . . accomplished with SPEED-NUTS.

SPEED-NUTS provide rapid assembly and lower production costs and are available in both standard and special shapes . . . Write for card of assorted samples and list of their many established uses.

Speed Nuts PATENTED

TINNERMAN STOVE & RANGE CO. · SPEED-NUT DIVISION · CLEVELAND, OHIO

Men of Industry

(*Concluded from Page 23*)

chief engineer, which he has occupied since 1920. His new work is principally concerned with special engineering and patent matters.

♦ ♦ ♦

Arthur H. Dittmer, president, and all other major officers of the Dittmer Gear & Mfg. Corp., Lockport, N. Y., have been re-elected by the directors of the company.

♦ ♦ ♦

F. S. Markert has been named assistant general manager of the Ferro Enamel Corp., Cleveland, manufacturer of porcelain enamels. Mr. Markert was graduated from the University of Illinois in 1924, and has been associated with Ferro since 1926.

Charles Moghabghab, formerly connected with the Bellaire Enamel Co., Bellaire, O., has been made a member of the service department of Ferro.

♦ ♦ ♦

Hans E. Melin has joined the staff of the Wean Engineering Co. Inc., Warren, O., as sales engineer. Mr. Melin, a graduate of Chalmers Technical university, Gotenburg, Sweden, recently returned from abroad where he was associated with the Wellman Smith Owen Engineering Corp. of London.

Prior to his going abroad in 1935, Mr. Melin had been connected with the Aetna-Standard Engineering Co., Youngstown, O., in a sales and engineering capacity, for a period of seven years.

Activities of Steel Users and Makers

OTIS STEEL CO., Cleveland, has opened an eastern district sales office in the Chrysler building, New York. E. A. Steif, who for many years has represented the company as manufacturer's agent in the East, has been appointed manager of sales for the New York district.

♦ ♦ ♦

Allegheny Steel Co., Brackenridge, Pa., has reopened its office in Cleveland, located at 1621 Euclid avenue.

♦ ♦ ♦

Chain Belt Co., Milwaukee, has moved its Pittsburgh office to 526 Grant building.

♦ ♦ ♦

Egan, Webster & Co. Inc. has moved its Pittsburgh offices from the Grant building to 3011 Koppers building, Pittsburgh.

♦ ♦ ♦

Consolidation of the sales departments of the Foster Wheeler Corp. and the General Regulator Corp. has been completed. Distribution of General regulators will be made through the branch offices and agents of Foster Wheeler Corp., with headquarters at 165 Broadway, New York. C. J. King, who has been identified with General Regulator since it was organized, will direct this work from New York as in the past.

♦ ♦ ♦

Continental Iron & Steel Co., New York, has moved its Pittsburgh office from the Oliver building to 902 Keenan building. H. D. Stalnaker continues as district manager.

♦ ♦ ♦

New York district sales office of the Republic Steel Corp., Cleveland, has opened a new sub office in the State Bank building, Albany, N. Y., with J. M. Higinbotham, salesman, in charge.

♦ ♦ ♦

Grand Rapids Metalcraft Corp., Grand Rapids, Mich., stockholders have approved merger of the company with the F. L. Jacobs Co., Detroit, the resultant company to be known under the latter name.

♦ ♦ ♦

Petrie Tractor & Equipment Co., with offices in Billings, Butte and Great Falls, Mont., has been appointed distributor for Link-Belt crawler shovels, draglines and cranes for the state of Montana, by Link-Belt Co., Chicago.

Three Take New • Posts with • Boston Gear Works

Neal W. Foster

Walter J. Henry

Martin T. Schumb

NEAL W. FOSTER has been elected executive vice president of the Boston Gear Works Inc., North Quincy, Mass. He joined the organization last year and formerly was vice president and general manager of the National Acme Co., of Cleveland.

Walter J. Henry has been appointed vice president in charge of sales. For the past few years he has held various positions in the sales department of the company and formerly was general manager of Wireless Specialty Apparatus Co., and vice president of Henry & Wright Mfg. Co.

Martin T. Schumb has been named vice president in charge of engineering. With the exception of a short time when he was a draftsman in the ordinance department, he has been connected with the Gear Works approximately 30 years. He is a graduate of Lowell institute in mechanical and electrical engineering and is a member of the American Society of Mechanical Engineers, American Society for Metals and American Gear Manufacturers association.

These changes became effective April 1.

WINDOWS OF WASHINGTON

WASHINGTON

WHILE it may be that the wish is father to the thought, democratic leaders on both sides of the capitol informed newsmen last week congress will be able to adjourn before the republican convention in Cleveland, June 9. This may only be a day dream but the President is taking it seriously and has made arrangements to go to Canada and be there June 8. This engagement, however, has been made contingent on congress adjourning before that time.

The house has completed work on all "must" bills, so far as it can until after the senate has acted.

After considerable bickering the house last week passed the relief bill and now both that and the tax bill are on the doorstep of the senate. That makes the situation much more difficult because under the house rules it is easy to put a gag rule in effect, but it is virtually impossible in the senate. When the senators want to talk they talk.

Some Democrats in Opposition

As this is written the chances are about even as to whether the senate finance committee will turn loose the rewritten tax bill before early this week. One thing is sure, some of the democratic members of the finance committee have joined hands with the solid republican members and the bill when it comes from the finance committee will be considerably different from that which was finally passed by the house. Senate leaders are about reconciled that they will have to make the best of a bad mess and do some compromising.

Business and industry really did a good job of complaining before the senate committee, and did it in such a way that the members had to sit up and take notice. That started the bolt from the regular democratic "sign-on-the-dotted-line" bill which senate leaders were trying to put over.

Of course, as the bill comes from committee it may not be all that business wants, but it is a foregone conclusion that it will be better than that which the house turned out.

No one can tell what the rewritten bill will look like, but the gossip here is that it will follow largely the lines of the original, undistributed earnings tax plan of the late Senator Jones of New Mexico. The proposal contemplates, it is whispered, the retention of substantially the present corporation income tax, with graduated surtaxes superimposed on undistributed earnings.

Treasury Officials on Spot

As roughly outlined by Senator Harrison, chairman of the committee, it would levy a 15 per cent corporation income tax on all corporations, but companies retaining 30 per cent and less, of earnings, would not be subjected to the proposed additional surtax.

There were great doings last week before the senate finance committee. The committee decided it would reopen its hearings on the bill, that is, insofar as government officials were concerned. Various experts of the treasury department, headed by the secretary, came back to give their views. They were ridden up and down by members of the committee who are opposed to the house tax bill.

A little effort was made by the democratic leaders of the committee to soften the questions and the way they were asked, but the treasury officials were given one of the hardest examinations on Capitol Hill in many a day.

Senator Byrd, of Virginia, who is strongly opposed to the tax bill as passed by the house, sent a letter to Mr. Morgenthau asking for some additional information on corporations, which roused the secretary because the papers carried the story before the letter was actually received by the treasury department.

Senator Byrd said that "it has been stated that many of our financially strong corporations, especially those of substantial size, will pay little or no taxes to the federal treasury if the pending bill is passed. I am checking the accuracy of these statements, and I am likewise interested in the opportunities that may be afforded such corporations by the bill to avoid the payment of taxes."

He continued: "We must guard carefully against giving these large corporations a greater advantage and perhaps a strangle hold over the present smaller competitors. Frankly, I am concerned about the application of the proposed tax policies to those corporations which now have large surpluses and a strong cash or credit position.

Would Protect Small Fry

"We must make certain that legislation does not prevent the healthy growth and expansion of our smaller businesses by imposing a penalty upon them if their financial position and their business opportunities do not permit the payment in dividends of substantially all their profits. I want your assistance in appraising the situation."

In that same communication the senator set forth several tables, the first of which showed a number of corporations now paying a 15 per cent tax which would not pay any tax under the new bill. Some of the companies in this list included General Electric, American Smelting & Refining and American Telephone & Telegraph. There was a long list of similarly strong organizations.

The United States Smelting & Refining Co. was in a list with a number of other corporations which

would pay less than 5 per cent under the new bill, while General Motors, American Can and a number of others were in a third list which would pay less than 10 per cent.

IMPORT DUTIES REDUCED ON FRENCH CAST IRON PIPE

In the trade agreement which the United States has recently concluded with France this country has made a concession by reducing the duty on French cast iron pipe and fitting imports of 40 per cent.

The present rate of duty is 25 per cent and this has been reduced to 15 per cent under the trade agreement. Last year no cast iron pipe or fittings were imported into the United States from France.

Substantial supplementary quotas will be made available by France under the agreement for future expansion of American exports of tractors and certain agricultural machinery.

Also the reduction in import duty from 6 to 2 per cent of the duty paid value will apply to these products, except tractors, which are not subject to the ordinary import tax but to a special rate applying equally to all foreign tractors and to domestic tractors. French imports from the United States on these products amounted to about $300,000 last year according to the state department.

New dealers are particularly pleased with the French trade agreement because they point out that France was really the first country to employ the quota system and the new agreement opens the door for the favored nation clause to be enjoyed by the United States.

GREEN CALLS ON ROOSEVELT TO AID WALSH-HEALEY BILL

Following a long meeting of the A. F. of L. executive council, William Green and members of the council called on President Roosevelt last week to urge him to do something about the passage of the Walsh-Healey government contract bill which, as reported, the house judiciary committee has definitely shelved for this session of congress.

In urging the President to give his unreserved approval of prompt enactment of this bill which establishes minimum labor standards on work done under government contracts, Mr. Green and his cohorts stressed the fact that this measure is firmly founded on precedent.

"Federal legislative history of nearly 70 years," said Mr. Green following the conference," gives ample support to the simple proposition on which this bill rests, namely that the government has the right to require that the work performed for it be carried out under conditions the government may prescribe.

"The measure is designed to establish minimum labor standards of wages and hours to prevent employment of children under 16 in the work done under government contracts. The same legal principle underlies existing measures such as the Davis-Bacon act of 1931, the Hawes-Cooper act of 1929, and the Ashurst-Sumners act of 1935."

Mr. Green stated that a survey of 3500 government contractors conducted last fall showed that since the invalidation of the NRA, 1448 such firms employing 405,373 workers departed from the wage and hour standards established under the codes.

RUMOR RICHBERG FOR SECRETARY OF COMMERCE

Backstage gossip here is to the effect that Donald Richberg is being seriously considered as secretary of commerce if the present administration is returned to office. This, of course, is based on the fact that "Uncle" Dan Roper will retire on the first of the year. He has announced this to some of his close friends.

Mr. Richberg has been coming back strong with Mr. Roosevelt and the talk here is that on any number of industrial problems he has been called into conference.

The erstwhile administrator of the Blue Eagle did not sulk when his time arrived to take the rap from the administration. He kept his head and did not talk back. This, in itself, is supposed to have somewhat endeared him to the administration.

If there is any truth in the statement, the steel industry should be interested because not only has Mr. Richberg stood up for the basing point system, but during the recent hearings on the Wheeler antibasing point bill, he did a wonderful job for the steel industry, whether he meant to or not.

FERROMANGANESE DUMPED?

Complaint has been filed with the custom bureau of the treasury department alleging the dumping of ferromanganese on the American market from both Germany and France. A similar complaint was filed two or three years ago but no dumping could be found by the government at that time.

Figures available at the department of commerce show that during 1935 about 20,000 tons of ferromanganese were imported into the United States of which 2091 tons were imported from France and 1075 tons from Germany.

EXPORT RATES SUSPENDED

The interstate commerce commission has suspended until Dec. 10 the operation of certain railroad schedules which propose to cancel present export commodity rates applying on iron and steel tanks and tank material from points in Illinois and western trunk line territories via certain routes to gulf ports which would result in increases.

PRESIDENT FAVORS LOW-COST HOUSING AS EMPLOYMENT AID

Secretary of Commerce Roper wants a census of unemployment, to be taken by his census bureau.

In this connection, it is stated on authority that to make ready for such a census and to train men would take conservatively six months. It would take more time than that—perhaps a year—to complete the census.

A recent census was taken by a private institution giving present unemployment of employables at about 4,000,000 to 6,000,000, which is far from the A. F. of L. figures of some 12,000,000. The latter includes unemployables as well as employables.

The President is most anxious to find some way out of the present unemployment situation and to that end he has been having conferences recently with many industrial leaders. He stated recently that none of them had pointed a way out, other than to suggest that it would probably be advisable to select certain industries which are backward in getting into production and try to stimulate them.

One of these industries was railroad equipment and the President stated that it is quite impossible to do anything about this at the moment, owing to the fact that the railroads of the country do not have much money to purchase equipment —no matter how badly they may need it. He did point out, however, that some change in capital structure might be made for the railroads which could remedy this situation. At the press conference in which he mentioned this he stated that there is nothing in sight along this line at the moment.

The other industry specifically mentioned by the President was construction. The matter of stimulating the construction industry of the country has absorbed the attention of the administration for many months. It has apparently been impossible for the brain trusters and others to get together on an idea that meets with the approval of all of those advising with the President on this subject. In fact, the conferees have been very much at odds on the subject.

What the President has uppermost in mind is low cost housing and this will help the steel industry if it can ever be stimulated. If something is not done in this connection in the near future it may have to go over until autumn, because the New Dealers are going to be very busy shortly on their campaign.

Editorial

Creative Thinking Will Pay Big Dividends in 1936

INDUSTRY thrives upon a steady flow of constructive ideas—ideas which make for greater efficiency, better organization and improved methods and products. Creative thinking is particularly valuable in a period of expanding business when worthwhile developments can be turned to profit more promptly than in times of declining activity or depression.

Therefore, the current signs of intensive drives for new ideas in many branches of the iron, steel and metalworking industries are gratifying. The evidence is found in the renewed activity in the design of machinery and equipment, in the development of new materials and processes, and in the increased appropriations for research.

A careful appraisal of the attention being given to these activities indicates that industry undoubtedly is placing a higher value upon the development of ideas in 1936 than it did in 1928 and 1929, when the volume of business was at its peak. For instance, a survey by the American Iron and Steel institute shows that 42 steel companies, accounting for 90 per cent of the productive capacity of the industry, will spend $9,200,000 for research this year, as against $8,100,000 in 1935 and $8,700,000 in 1929. Of the appropriation for 1936, which is believed to be the highest for any year in the history of the steel industry, 40 per cent will be used to find means of improving products and 10 per cent will be spent to discover new markets and new uses for products.

Industrial Expositions Reflect Renewed Activity in Design and Development

Another index of the revival of activity in development is found in the exhibits at industrial expositions. The recent show of equipment of the foundry and allied industries held at Detroit in connection with the fortieth annual convention of the American Foundrymen's association reflected an unusually marked advance, not only in the design of machines and equipment, but also in the quality and utility of materials and products. In this respect the foundry show revealed the same degree of creative skill that was so much in evidence in the great machine tool show held in Cleveland last September. Both events were monuments to the efficacy of good ideas and the ability to adapt them to practical use.

Again the importance of development is emphasized by the experience of individual companies. Recently the head of a corporation engaged in the manufacture of calculating machines paid a high tribute to the creators of new ideas in design when he declared publicly that 95 per cent of the company's profit is derived from "things developed by its own engineers." According to his statement, the company's aggressive policy in original design has been largely responsible for the increase in the number of employes from 235 to over 9000 during the past 22 years. The creative thinking of the organization is reflected in the 874 patents it has filed during that period.

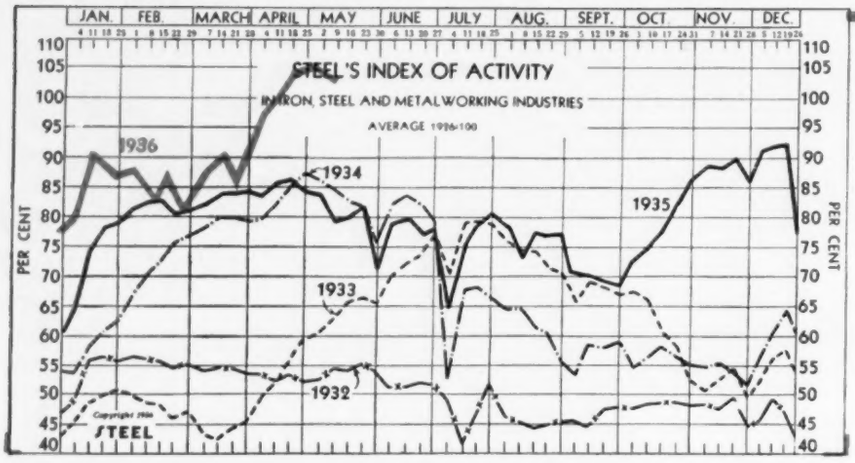
Creating Equipment and Processes To Solve Current Problems Wins New Business

A more pointed illustration of the value of original thinking is afforded by the experience of two concerns in a specialized equipment field. The two were about on a par in 1929. Their products were similar and they ranked about even on prestige, volume of business and profits. During the past six years, however, Company A has contented itself with occasional improvements or redesigns of its 1929 line of equipment, whereas Company B has anticipated every step of progress in its field by introducing models embracing original and highly practical ideas. Company B has so far outdistanced Company A in volume of business and in profits that the two no longer are considered to be competitors.

Further evidence of the value of invention and research could be cited in abundance. The pertinent point is that original thinking pays big dividends today. The management that is concentrating solely on production, while neglecting research and development work, probably is winning certain limited profits for 1936 at the expense of bigger stakes in subsequent years.

Every consuming field in the metalworking industry has unsolved problems involving methods, materials and products. The companies which are able to contribute original, practical thinking to the solution of these problems will be rewarded handsomely.

THE BUSINESS TREND



STEEL'S *index of activity in the iron, steel and metalworking industries declined 0.3 points to 102.9 in the week ending May 9:*

Week ending	1936	1935	1934	1933
Feb. 29	83.4	81.1	76.8	47.4
Mar. 7	87.7	82.0	78.6	43.4
Mar. 14	89.7	84.0	79.9	42.7
Mar. 21	86.0	84.0	79.7	44.6
Mar. 28	91.2	84.3	79.3	45.2
Apr. 4	96.8	83.4	79.6	49.1
Apr. 11	99.6	85.4	82.2	52.6
Apr. 18	103.1	86.3	85.0	55.8
Apr. 25	103.6	84.9	87.5	59.5
May 2	103.2†	84.6	86.0	60.3
May 9	102.9*	79.3	84.4	62.5

†Revised. *Preliminary.

The index charted above is based upon freight car loadings, electric power output, automobile assemblies (estimated by Cram's Reports) and the steelworks operating rate (estimated by STEEL). *Average for 1926 equals 100, weighted as follows: Steel rate 40, and car loadings, power output and auto assemblies each 20.*

Industry Studies Prices as Activity Remains Steady

CERTAIN developments in recent weeks have aroused renewed interest in prices of industrial materials and products. The strength of conflicting forces is such that the general trend may continue mixed or uncertain through the early summer months.

Superficially the strongest factor in the current price situation is the realization that higher costs are inevitable. The burden of the federal social security program already is adding a heavy charge against industrial payrolls. The tendency is toward adjusting salaries and wages upward. Another potential addition to costs is seen in the incipient movement to grant vacations to employes. Rising taxes are a certainty.

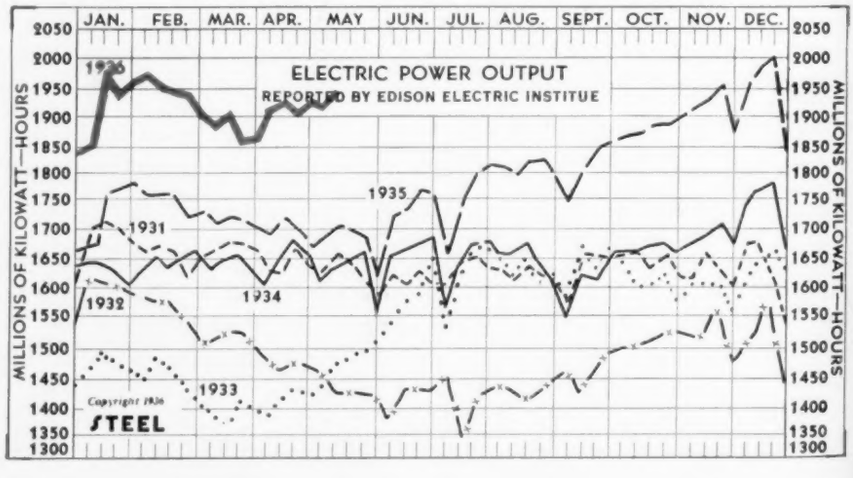
Against these rising costs are arrayed the ability of industry to absorb part of the increase in more efficient operations and also the pressure of competition for lower prices. Many observers feel that the play of conflicting factors will result in a mixed price trend until early fall, when an upward surge may crystallize.

The stability of industrial operations during the past month has helped to maintain a steady price situation in most commodities. STEEL's index of activity for the week ending May 9 stands at 102.9, a fractional drop from 103.2 in the previous week. The index has hovered around or above the 100 mark for five consecutive weeks.

While the peak seems to have been reached in the final days of April, no marked recession has occurred in any factor. Steelworks operations and automobile output are slightly easier, freight traffic is holding steady and electric power output showed an unseasonal gain in the latest week.

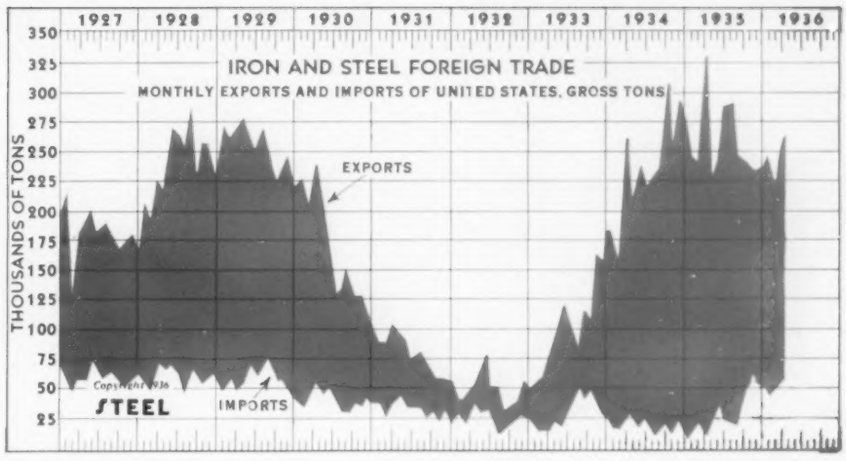
Millions Kw.-Hrs.

	1936	1935	1934	1933
May 9	1947	1701	1643	1468
May 2	1928	1998	1632	1436
April 25	1932	1673	1669	1428
April 18	1914	1701	1673	1431
April 11	1933	1725	1642	1409
April 4	1916	1700	1616	1399
March 28	1867	1712	1665	1402
March 21	1862	1724	1658	1409
March 14	1900	1728	1650	1375
March 7	1893	1724	1647	1390
Feb. 29	1903	1734	1658	1422
Feb 22	1941	1728	1646	1425
Feb. 15	1950	1760	1641	1469
Feb. 8	1952	1763	1652	1482
Feb. 1	1962	1762	1636	1454



Steel Foreign Trade Shows Sharp Gain

	1936		1935	
	Imports	Exports	Imports	Exports
Jan.	50,489	241,564	22,784	262,740
Feb.	43,358	213,802	28,905	228,537
March	56,720	264,337	21,409	323,035
April			28,866	205,336
May			47,719	286,598
June			33,208	289,687
July			31,894	296,802
Aug.			31,312	247,312
Sept.			53,158	244,419
Oct.			59,569	238,358
Nov.			56,637	205,242
Dec.			53,678	239,268

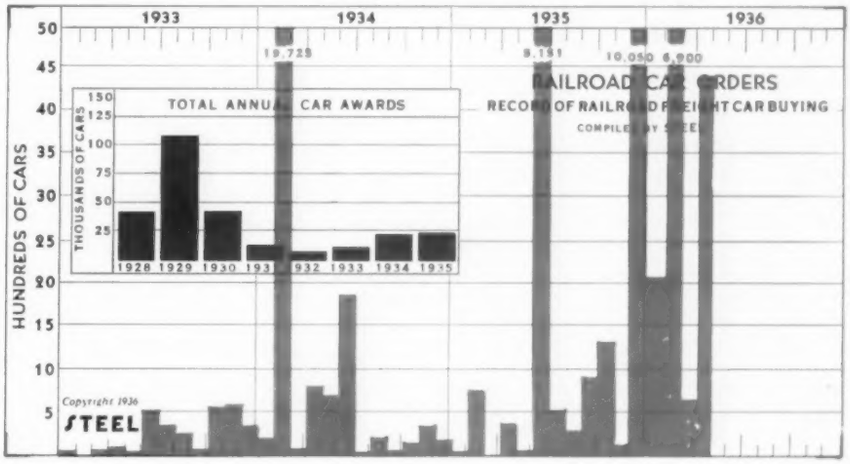

1927 1928 1929 1930 1931 1932 1933 1934 1935 1936
IRON AND STEEL FOREIGN TRADE
MONTHLY EXPORTS AND IMPORTS OF UNITED STATES, GROSS TONS
THOUSANDS OF TONS
EXPORTS
IMPORTS
Copyright 1936
STEEL

Finished Steel Shipments Near Million Tons

	Gross Tons		
	1936	1935	1934
Jan.	721,414	534,055	331,777
Feb.	676,315	583,137	385,500
March	783,552	668,056	588,209
April	979,907	591,728	643,009
May		598,915	745,063
June		578,108	985,337
July		547,794	369,938
Aug.		624,497	378,023
Sept.		614,933	370,306
Oct.		686,741	343,962
Nov.		681,820	366,119
Dec.		661,515	418,630

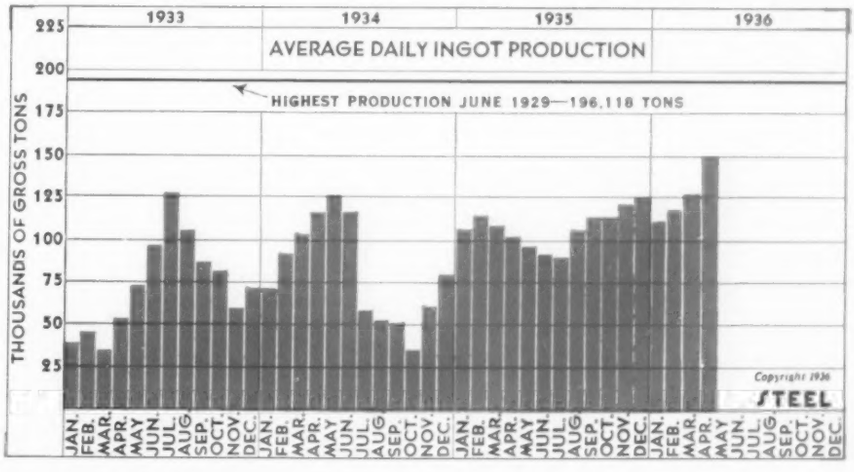
April Freight Car Awards Second Highest This Year

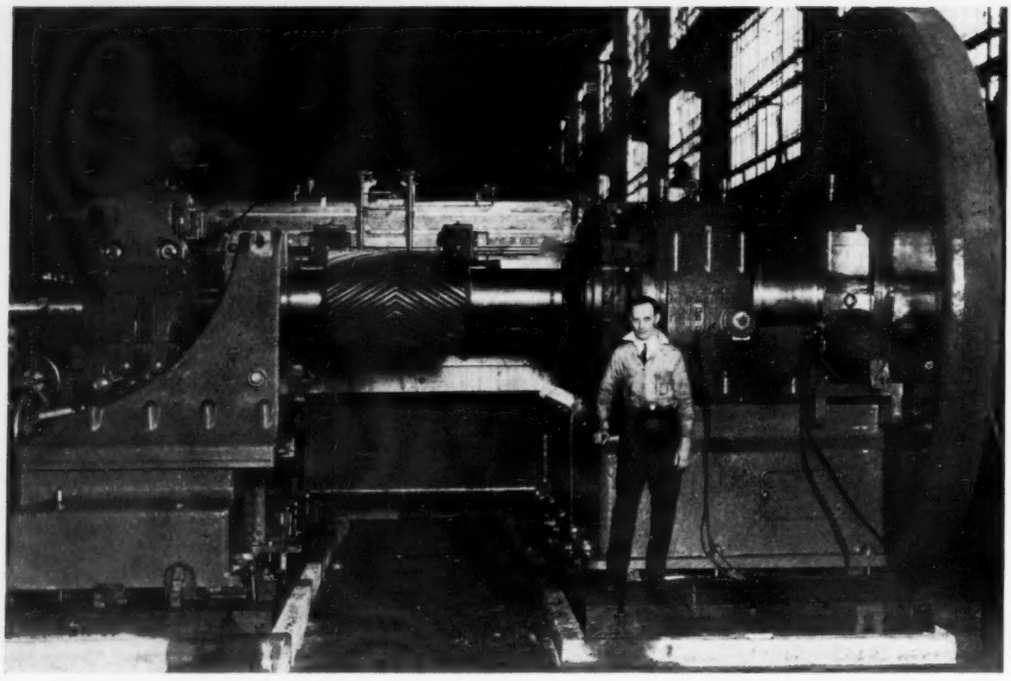
	1936	1935	1934	1933
Jan.	2,050	24	152	3
Feb.	6,900	806	19,725	0
March	632	0	30	5
April	4,427	350	800	50
May		2	717	8
June		5,151	1,835	500
July		500	19	306
Aug.		200	105	202
Sept.		875	7	23
Oct.		1,250	75	514
Nov.		100	254	533
Dec.		10,050	110	316



April Ingot Production Highest Since 1930

	Gross Tons		
	1936	1935	1934
Jan.	112,813	106,302	73,968
Feb.	118,577	115,595	92,164
March	128,576	110,204	103,646
April	151,625	101,562	117,443
May		97,543	125,907
June		90,347	117,672
July		87,224	59,578
Aug.		107,997	51,161
Sept.		113,000	50,759
Oct.		116,398	54,885
Nov.		121,170	61,947
Dec.		122,936	78,570





LARGEST of the Sykes gear cutting machines, specially developed for heavy work, cutting a heavy pinion. Accuracy is a feature of the machine, an important factor in production of gears which operate quietly

Effective Prevention of Gear Noise

BY W. E. SYKES
Farrel-Birmingham Co. Inc.

ALMOST everybody responsible for manufacture and performance of gears is troubled with gear noise. Occasionally gear noise becomes such a difficulty that search for means to overcome it proves distracting to the gear manufacturer. Those in the gear business are apt to think that noise is a particular bugbear of the gear manufacturer; however, manufacturers of other products also have the noise problem to cope with.

A long list could be compiled of machinery which creates objectionable noise unless preventative steps are taken. Therefore, the gear manufacturer has no good reason to feel sorry for himself on account of the noise problem. On the contrary, he should be thankful that manufacture of quiet running gears is no more difficult than it is.

There are many definitions of the word "noise." It has a wide variety of uses and the dictionary definitions do not help much to define it when applied to gears. The best definition is the legal one which states that noise is a sound which creates a nuisance. From this it can be inferred that a sound is not necessarily a noise; on the other hand, we cannot have a noise without a sound.

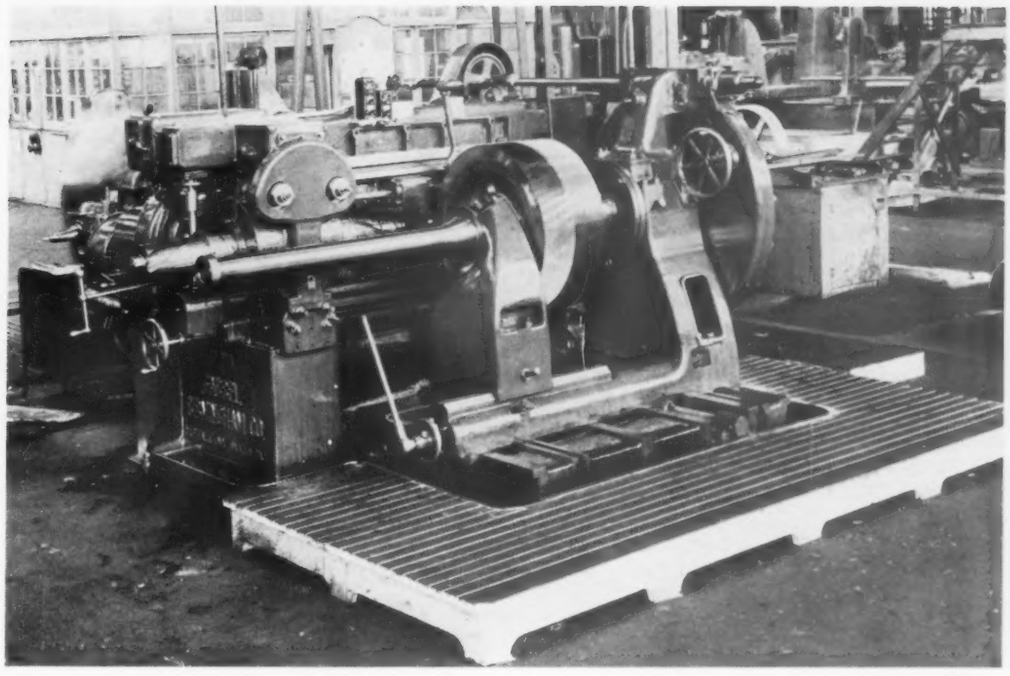
One cannot consider the question of noise long without asking for a standard of noise measurement, for he soon discovers that there is scarcely anything which does not make a sound. It would be possible to write a paper on the subject of sounds audible to the human ear, and to explain about the relatively new sound measurement unit. At the 1934 annual meeting of the American Gear Manufacturers association an excellent lecture and demonstration was given by Prof. F. A. Firestone, University of Michigan, Ann Arbor, Mich., on noise measurement of gears. This paper, therefore, will deal only with gear noises which are annoying to the human ear unaided by sound amplification devices.

Nearly everyone engaged in the practical manufacture of gears has seen some gears which could scarcely be heard and which may in the ordinary sense be termed "silent." Therefore, it seems safe to say that gears can be made silent. According to the author's observations gears which run silent, in the ordinary sense of the word, can be made without great difficulty.

Causes of gear noise are: (1) Faulty design; (2) faulty workmanship; (3) faulty lubrication; and (4) overloads.

The expression "faulty design" as here used applies not only to the gears themselves but also to the design of shafts, bearings, and housing. Design of gear teeth should be in accordance with correct geometrical principles. It should be such that the gear teeth will have correct action and, in addition, the helical principle should be utilized because it is easier to obtain silence with gears having helical teeth than those having straight teeth. Although the design must be correct kinematically, it is not satisfactory unless it takes into consideration the limitations of manufacture.

Occasionally, because of ignorance on the part of the designer, straight-



GEAR generator for precision work on high-speed gearing up to 60-inch diameter and 20-inch face width. Gear shown is for reducing speed from a turbine running at 6000 revolutions per minute, transmitting 1500 horsepower

Is Not Insurmountable Problem

tooth gears are made having such a small number of teeth that the base circle pitch is larger than the length of the line of action, which makes silent operation impossible. Possible faults of design are too many to enumerate. It is only possible to deal with a few of the most common ones and it therefore seems advisable to state the requirements which have to be met rather than try to describe in detail the errors which are made.

For quiet operation it is preferable to arrange for at least two base circle pitches along the line of contact. This necessitates a somewhat large number of teeth in the gear pair; but when there is a practical limitation of the number of teeth then modified addenda and dedenda have to be resorted to. In general, the sum of the number of teeth in any gear pair, that is to say, the number of teeth in the pinion plus the number of teeth in the wheel, should not be less than 60; however, reasonably good results can be obtained with a less number of teeth.

A reasonably rigid gear and pinion structure should be provided and in this dissertation the term "pinion" is intended to include worms, and the term "wheel" is intended to include worm wheels. Pinions should be large enough in diameter in proportion to their length to avoid excessive deflection, and the wheels should be so designed that they will not unduly deflect under full load and will not warp too far out of shape after being cut and heat treated.

Shafts and bearings should be sufficiently rigid; for example, the bearings should be close enough together to prevent excessive deflection of the shaft, and the bearings themselves should be sufficiently well supported to prevent excessive deflection under full load.

Design of the gear housing requires careful attention. It should be oil-tight and dust-proof. It should have sufficient oil capacity and ample heat radiating surface should be provided; if necessary, an oil cooler of correct capacity and of perfect reliability must be included.

Great care must be exercised to select the most suitable type and size of bearings. In some cases antifriction bearings can be used advantageously. In other cases the velocities are too high for such bearings and sleeve bearings must be resorted to. Correct lubrication must also be provided for the bearings.

It is likewise desirable in the design to provide for correct gaging of the position of the shafts, or at least not to make the design such that the gaging of the center distances or alignment or endwise adjustment where necessary, cannot be made at all or can only be carried out with difficulty.

Selection of materials requires

THE accompanying article constitutes a paper which received acclaim upon its presentation before the twentieth annual meeting of the American Gear Manufacturers association in Philadelphia, April 20-21. The author, W. E. Sykes, is consulting engineer, Farrel-Birmingham Co. Inc., Buffalo.

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careful consideration. It is not sufficient merely to select materials which have the proper physical characteristics for the service required. It is advisable—even necessary—to consider whether such materials can be satisfactorily dealt with during the manufacturing process; for example, it would be a mistake to select a forged steel heat treated to such a degree before the gear cutting operation that it would be so hard as to damage the tools and thereby cause gear cutting inaccuracies; it would also be wrong to choose a material to be heat treated after the cutting operation which would be likely to warp unduly. When cast materials are used, it is advisable to select one which will be reasonably uniform in hardness and cutting characteristics.

The designer's work is not properly done unless he considers and takes care of the possible extraneous influences on the gear drive. He must take steps to prevent extraneous forces pushing the gears out of position. This generally involves consideration of the type of couplings used. He also has to take into consideration the possibility of side thrusts due to overhanging loads being imposed on the shaft projections of the gear unit. To guard against such conditions, antifriction bearings often are useful, and in many cases the tapered type of roller bearing is especially valuable. In other cases deep groove ball bearings can be used advantageously. Such bearings need little running clearance so that any force imposed on the shafts is likely to displace them little.

Flexible Couplings Needed

Where sleeve bearings with forced lubrication have necessarily to be employed because of high velocity, use of suitable flexible couplings becomes imperative, and sometimes it is also advisable to provide a thrust bearing of the Kingsbury type.

Consideration should be given also in the design to the possibility of finish-cutting the gears after they are mounted on their shafts to make them true relative to the journals. For this reason shafts which are too long to be accommodated in the gear cutting machine should be avoided if possible.

The designer should bear in mind that occasionally gears are blamed for noises which they do not create. On many occasions the author has discovered that the noise which was attributed to gears came from bearings. Therefore, the designer should make sure that the bearings themselves are not likely to make a noise

In some cases oil noises result because the gears are immersed in too heavy a lubricant. It is the designer's duty to take care that the oil level and the nature of the lubricant is specified. In cases where the velocity of the gears exceeds a certain amount, spray lubrication should be provided and it is the designer's duty to ascertain whether or not spray lubrication is required.

When a forced lubrication device has to be embodied in the gear unit design, care must be taken to use one which will itself not create a noise or cause the gears to create a noise.

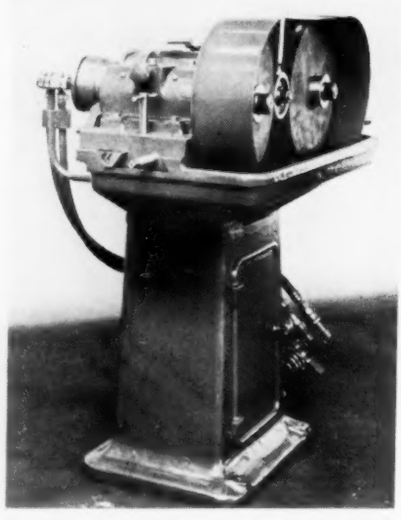
Although it is impossible to obtain satisfactory gear performance without correct design, it is equally impossible to obtain silent gears without the highest grade of workmanship. Most gear noises are caused by faulty workmanship. There are frequently many excuses for poor workmanship. Such words as "harmonics," "resonance" and "sound amplification" are often used in connection with gear noises, but in the author's experience more than 90 per cent of the trouble has been due to inferior workmanship.

The word "workmanship" here applies, not only to the gears themselves but also to the housing, bearings, shafts, alignments and installation. In this connection it should be noted particularly that antifriction bearings sometimes are faulty. To deal with the details of workmanship thoroughly would require a lengthy paper. It is only possible, therefore, to deal with the more common faults in a somewhat cursory manner.

Those gear makers who have gained a reputation for high-quality, high-speed gears have discovered that a relatively high degree of precision is necessary in the manufacture of all elements of gears and their attachments. Quality of workmanship and material in this case covers not only the general precision, for the degree of finish or polish on the tooth surface must be of the same kind as that obtained in the manufacture of precision ball and roller bearings. It is not sufficient to take what is termed a "clock indicator" of an ordinary kind and rely on it for indicating inaccuracies. Instruments of the highest degree of precision must be obtained and used skillfully.

It is not satisfactory to check alignment or level of shafts by the kind of level found in the average machinist's kit. It is desirable to use precision levels indicating to 0.0002-inch per foot. Dial gages which will actually indicate 0.0001-inch have to be used. It is not sufficient merely to buy a ten-thousandths dial gage from a reputable maker; such a gage must be carefully used and checked from time to time to make sure that it really is sensitive.

Use of line bars, for checking parallelism of axes, or correct angularity of axes, when gears operating on nonparallel axes are being dealt with, must be most accurate.



IN this new lapping machine the gear to be lapped is between two larger gears, the pressure of each being equal and opposite to avoid tendency to displace the lapping gear

Machines Must Be Accurate

Gear cutting machines of the highest grade are necessary and it is of course equally necessary to use cutting tools which are accurate within close limits. To insure uniformly good results, nothing can be left to chance in the matter of workmanship; every element must be checked thoroughly, and to do so usually entails checking everything by three separate and reliable methods. Gear teeth, of course, must be cut concentric to the axis on which the gear will run, and the pitch, or division, must be extremely accurate—preferably the largest inaccuracy in division, or pitch, should not be more than 10 seconds of arc.

Tooth contours need to be precise; careful observations indicate that 0.0001-inch error is in some cases too much. Gears having helical teeth seem to be essential and it is nearly as important that the helixes be as accurate as the tooth contour; furthermore, they must be accurate in relation to the axis on which the gear actually will operate. It is equally important that tooth surfaces be smooth.

When carefully considered, the foregoing requirements will soon convince the experienced technician that the only way to fulfill them is by a final lapping operation. This seems essential whether or not the gears are hardened, and it is also essential whether or not the gears are ground. According to the present state of the art, it seems that grinding of gears, while helpful and in some cases even desirable, does not provide the necessary high degree of precision.

Lapping of gears is at present an art and probably will remain so to

PLENTY OF POWER

Truck illustrated made by The Elwell-Parker Electric Company.

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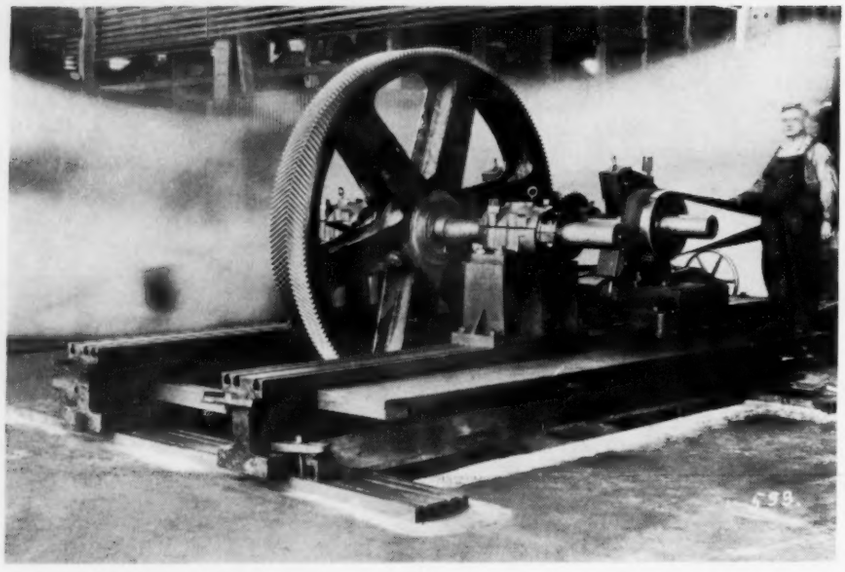

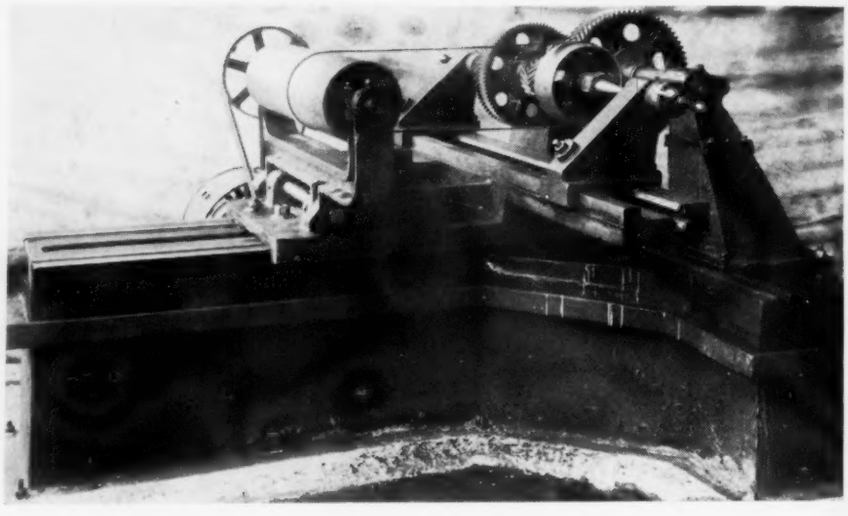

THE illustration above shows a large gear being tested for silent running and for tooth contact. At the right is a similar test machine, for use with gears of smaller size

some extent. While it seems practical to polish a cylindrical, conical, or flat surface by means of an abrasive wheel, it does not yet seem possible to finish a helicoidal surface with the requisite degree of precision by any method other than lapping.

The foregoing remarks are made having in mind high-speed gearing which has to carry heavy loads relative to its size. Lower speed gearing will run silent in a practical sense when not made quite as precise, but nevertheless a relatively high degree of precision is desirable for all gearing, even that operating at the lowest speeds.

Mounting Is Important

Utmost precision in the manufacture of the gears themselves can be nullified by inaccurate mounting. The relative position of the shafts needs to be as precise as the gearing itself. Obviously, it is useless to make a pair of gears to operate on exactly parallel shafts and then to mount the shafts out of parallel. It is equally futile to expect a pair of gears to operate on shafts, the axes of which should cross at an exact right angle and which are set at some other angle; similarly, gears which are made to operate on shafts the axes of which intersect cannot operate properly when mounted on shafts the axes of which are offset.

Although manufacture of practically silent gearing is somewhat exacting, it is not quite as difficult as it is sometimes believed to be. Intelligent, painstaking effort will bring surprisingly good results. Careless, slipshod work and merely trusting to luck will result in nothing but grief and trouble. Halfway measures usually will result in about one gear out of six being good, the remainder being indifferent or poor. Utilization of the best present-day equipment and methods will result in about 80 per cent excellence, 15 per cent moderate results, and the remainder just passable.

No gear will run silent under load unless it is reasonably well lubricated. The question of lubrication in reference to design already has been dealt with. It is necessary only to add that clean lubricants in a clean housing are essential. It is obvious that precision gearing will not operate properly if there is grit between the teeth. Further, it is obvious that if too thick a lubricant is used the gears will track and lubricant will not be spread properly over the teeth. If a thin lubricant is used, or if a relatively thick lubricant is overheated, lubricating qualities will not be satisfactory.

Those who have had experience in testing gears for silence are well aware that any particular pair of gears may run silent at certain loads and become noisy at other loads. Some gears will run perfectly silent at no load but will make a noise when carrying only 10 per cent of the designed load. Others will run silent at 50 per cent load and noisy at 100 per cent load. Again, others will run silent at full load and may be noisy at 50 per cent overload. Others will run silent at any load which does not result in damage to the tooth surface or to the shafts and bearings. It is desirable, therefore, when investigating a noise complaint to make sure that the gear is not overloaded, and that it has not been overloaded and damaged thereby.

All remarks hitherto made are intended to apply to all kinds of gears at all practical speeds. It is present-day custom to talk loosely of low-speed, medium-speed, and high-speed gears, also to refer to industrial gears, turbine gears, street car gears, automobile gears, etc. While speed undoubtedly makes a difference to the noise of gears, really precise gears, properly designed, will run quietly at full load up to high velocities. There are many sets running satisfactorily up to 12,000 feet per minute and there seems no good reason not to run such gears up to 18,000 feet per minute.

It is the writer's opinion that those gear makers who are troubled with noise will overcome it only when they have decided to pay the price in terms of capital expenditure and intelligently directed effort. It is barely necessary to add that unless they are philanthropists they will have to get their customers to pay the equivalent price in currency.

Not *One* to throw away!

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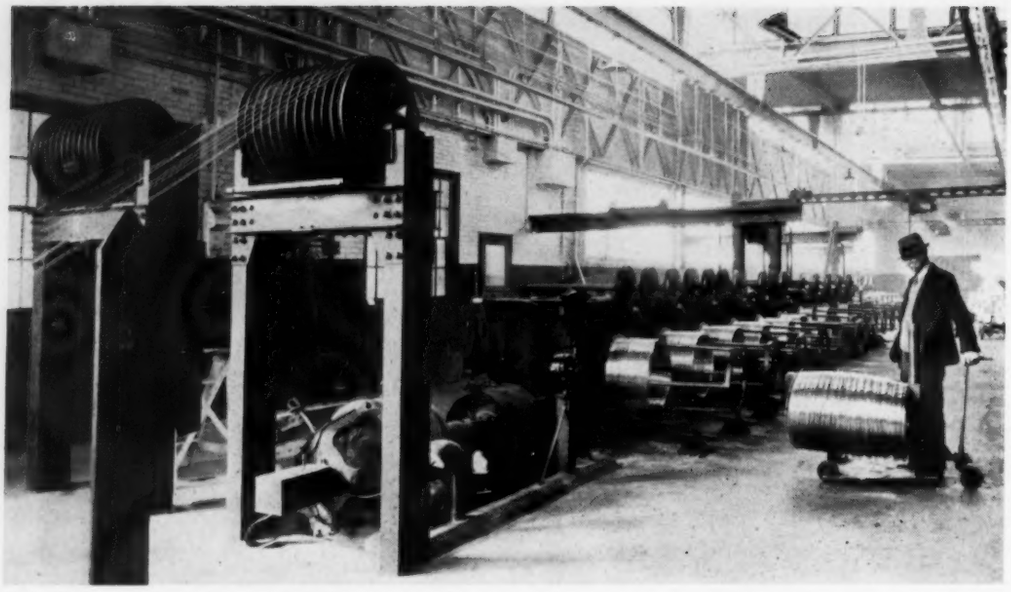
United States Steel Products Company, New York, *Export Distributors*

UNITED STATES STEEL



STRANDS of wire being carried from the electrolytic cells on overhead sheaves to keep them straight while going through tungsten carbide polishing dies

Electrogalvanizing Process Produces Ductile, Corrosion Resistant Coatings

RELATIONSHIP between the purity of a zinc coating and its physical properties was discussed in a paper presented by U. C. Tainton, electrometallurgist, at the Cambria plant, Bethlehem Steel Co., Johnstown, Pa., on the occasion of the recent formal opening of Bethlehem's new electrogalvanizing installation there (STEEL, April 27) The purity of the coatings produced by the electrogalvanizing process known as Bethanizing (STEEL, Dec. 24, 1934) and the precautions observed to obtain that purity were pointed out as reasons for the superiority of zinc coatings applied by that method.

Mr. Tainton's opening remarks concerning the properties of zinc as known to industry and zinc as prepared in the laboratory for chemical studies are significant. He stated: "Relatively modern as is the art of galvanizing, it may well be maintained that the coating of steel with zinc metal is a development more recent still; in fact of only the last few years. The justification for this statement lies in the fact that the properties of the element zinc are profoundly changed by the presence of even minute quantities of impurities, and the so-called zinc or spelter of commerce is really an alloy, entirely different chemically and physically from the pure zinc metal. The following quotations regarding the properties of zinc are taken from Hoffman's book, *Metallurgy of Zinc and Cadmium*, dated 1922: 'At ordinary temperatures zinc is brittle, being easily broken by striking with a hammer. . . . . Moist air oxidizes the surface, forming a grayish coating. . . . . Zinc is readily soluble in dilute sulphuric acid with evolution of hydrogen.'"

Mr. Tainton continued: "As far as can be ascertained, the first pure zinc was made by Prof. G. H. Stanley of the South African School of Mines, in whose laboratory the writer happened to be working at the time. It is not necessary here to detail the elaborate methods of purification employed. It is enough to say the properties of the metal obtained were quite different from those above mentioned. It was practically unaffected by dilute sulphuric and hydrochloric acids; it retained its brightness indefinitely, even in the atmosphere of the laboratory; and, far from being brittle, it could be hammered out into sheets similar to gold leaf and so thin they would transmit light.

"The first commercial production of zinc of a purity approximating that prepared by Professor Stanley was in the year 1928 at the plant of the Sullivan Mining Co., Kellogg, Idaho. This plant has continued to produce zinc, and at the present time all of its product is guaranteed to be of a purity of at least 99.9975 per cent; actually much of it is of even higher grade. Ordinary prime western zinc runs about 98.5 per cent, and the zinc in a hot-dip galvanized coating is around 96.0 per cent."

From these remarks it is evident that the use of the purest zinc obtainable under commercial conditions is first step toward obtaining zinc coatings which approach elemental zinc with regard to physical and chemical properties. For economic reasons it also became evident that the electrolytic process used at the Sullivan mine could be adapted to electrogalvanizing with the resultant elimination of the necessity for casting ingots of the metal. The advantages of this are obvious.

Raw Materials

Mr. Tainton further said: "The raw material consists of a roasted zinc concentrate, carrying between 50 and 60 per cent zinc. In addition to zinc there are normally present cadmium, copper, lead, silver and gold; iron, nickel, cobalt and manganese; aluminum, gallium, indium

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and thallium; silicon and germanium; arsenic and antimony; oxygen, sulphur, tellurium; magnesium, calcium, chlorine and fluorine. These elements all have a possible metallurgical or economic bearing on the operation of the process, and have to be considered in evaluating any given zinc concentrate."

"In the first operation of the process the roasted zinc ore is agitated with the return electrolyte coming back from the cells in which the bulk of the zinc has been extracted. This solution carries about 250 grams per liter of free sulphuric acid. During the first stages of this operation most of the elements mentioned above pass partly or wholly into solution; exceptions are lead and gold, also silver if sufficient chloride is present. Silica dissolves to form silicic acid. Iron, which is present in the feed as zinc ferrite, forms ferric sulphate, and this is partially reduced to the ferrous form by unroasted sulphide, always present to some extent. The other metals also dissolve as sulphates.

"As the addition of the zinc bearing material is continued, the acid strength falls, gradually approaching neutrality. Before this point is reached, however, two important matters must be taken care of. The first of these is to bring about the conversion of the silicic acid to gelatinous silica. This is accomplished by the addition of a small quantity of a fluoride (assuming that the material does not itself contain enough fluoride for this purpose). The second point is the complete oxidation of the iron to the ferrous form. This is effected by the addition of manganese dioxide, which goes into solution in form of manganous sulphate.

"As agitation is continued the gelatinous silica undergoes syneresis, the gel separating into two phases, one relatively concentrated, and the other quite dilute. It is important that there be present enough silica so that the concentrated gel particles have sufficient rigidity to retain their form in the subsequent filtering operation. It is frequently necessary to add soluble silica for this purpose. As the acid strength falls further, the ferric sulphate hydrolyzes and the iron is thus eventually removed from solution. This point is of greatest importance in connection with the successful operation of the process. The precipitated ferric hydrate happens to have strong adsorptive properties, particularly in regard to three elements which are deleterious in the subsequent electrodeposition of zinc, namely, antimony, arsenic and germanium. To secure good deposits of zinc, germanium must be removed to limits far below possible detection by analysis. One part in 20,000,000 of germanium will give rise to serious trouble.

"The progress of the reaction is watched by means of thiocyanate test paper and the addition of ore is continued until the red color fades out, indicating the removal of the iron. This occurs at a ρH around 3.5 at which zinc oxide is still soluble, thus insuring a high extraction of the zinc. The aluminum sulphate also hydrolyzes but not completely, and part carries over to the next stage of the purification.

"The pulp is now ready for filtration which is carried out in Burt-type filters. Here the solution is separated from the residue which now contains the iron and silica together with lead, gold, silver, antimony, arsenic, germanium, and some aluminum. Calcium, if present in amounts greater than the solution can carry, is also eliminated at this point. The clear solution is pumped to storage tanks from which it is drawn to the purification agitators, where it is treated with finely divided zinc dust at about 75 degrees Cent. This precipitates the other elements below zinc in the electrochemical series, namely, cadmium, copper, indium, gallium, thallium and tellurium. Nickel and cobalt, however, if present in any quantity precipitate only partially, and it is necessary to add a small quantity of a tellurium compound in order to free the solution from these elements, which are decidedly obnoxious in zinc electrolysis.

Solution Is Practically Pure

"The precipitated metals are separated by filtration, great care being taken to prevent the presence of oxygen which would cause re-solution of the impurities. The resultant solution, consisting essentially of zinc sulphate together with some amounts of sulphates of manganese, magnesium and calcium is ready for electrolysis. Before being drawn down to the cells each lot of solution is tested in the laboratory to make sure that it meets the required standards for purity. The concentrated neutral solution, carrying about 220 grams per liter of zinc, is drawn down into the electrolyte circuit at a speed corresponding to the amount of zinc being taken out, so that the acid concentration of the electrolyte is maintained between 200 and 270 grams per liter.

"If the various steps of the above process are properly carried out we shall have at this point a practically pure solution of zinc sulphate. It might be assumed that it is then a simple matter to obtain a perfect coating of pure zinc on steel.

"One primary difficulty arises from the fact that in depositing zinc from an acid solution we are, in a sense, going contrary to the laws of electrochemistry. When two dissimilar sorts of ions are present in a cathode layer the more electropositive ones, that is, those lower in the electrochemical scale, are discharged first. Consequently, from an acid zinc sulphate solution which contains both zinc ions and hydrogen ions we should get at the cathode only hydrogen gas and no zinc. This, in fact, it is only too easy to do.

"The deposition of zinc is only possible because of the peculiar phenomenon of overvoltage, which is the name given to the property that certain materials have of opposing the evolution of hydrogen at their surface. Pure zinc has it in a high degree; platinum black hardly at all. It is therefore easy to plate zinc

Conveyor System Saves Steps

FIFTEEN miles of conveyor system, consisting of 143 separate lines, are used in the Chrysler assembly and body plants, Detroit. The one shown is the overhead conveyor which transports engines from the block and dynamometer tests to the chassis assembly, a journey of nearly half a mile. By means of the conveyor system, workmen find materials at their elbow and can devote all their time to productive work

onto a pure zinc surface from an acid solution but impossible to do so onto platinum black. Iron is an intermediate case. The hydrogen overvoltage of iron is normally below the potential of zinc on the hydrogen scale. However, it rises with increasing current density and by sufficiently increasing this factor zinc may be deposited. If the surface is too rough, spongy or has certain foreign matter on it, it may be impossible to obtain a zinc deposit at any practicable current density. Hence this factor had to be considered in developing a satisfactory manufacturing process.

Surface Preparation Vital

"Another difficulty arises in connection with the property that iron has of adsorbing or occluding hydrogen. When hydrogen is evolved at an iron surface, as when steel is pickled in acid, hydrogen gas is occluded by the steel. Every one is familiar with the fact that hydrogen causes embrittlement. It is not so well known that occluded hydrogen also interferes with the bond between an electrodeposited coating and the steel base.

"It is vitally necessary therefore that the steel surface be free from all foreign matter such as grease, scale, rust and even spongy metal. It should not contain occluded hydrogen, and none should be introduced before the zinc comes down.

"To meet these conditions completely in the difficult case of wire, it was necessary to develop a new pickling method. This was based on the fact that a strongly electronegative element such as sodium would attack and combine with any nonmetallic substances on the surface, but would not attack the metal itself. The method employed is to make the steel cathode in a fused salt such as sodium hydroxide. The nascent sodium evolved combines with such elements as oxygen, sulphur and phosphorus and produces actually a purer metal at the surface than in the body of the steel itself. All grease or organic matter is eliminated and no hydrogen is occluded.

"The new Bethanizing unit at the Cambria plant of Bethlehem Steel Co. at Johnstown, Pa., has two plating cells, each 110 feet long and taking 40,000 amperes at normal load. There are normally 12 wires in each cell traveling at speeds of from 50 to 200 feet per minute, according to the thickness of coating and size of wire.

"The electrolysis is carried out in the case of wire at current densities from 700 to 2000 amperes per square foot. This is from 20 to 50 times as high as the current density ordinarily employed in plating with soluble zinc anodes, and makes possible the employment of high speeds.

"The anodes consist of an alloy of lead and silver which is far more resistant than lead alone, and accounts for the extremely small quantities of lead found in the finished product. During electrolysis the manganous sulphate is partially changed to permanganic acid, and this reacts with the residual manganous sulphate to form a precipitate of hydrated manganese oxides.

"The uncoated drawn wire coming from the reels passes first over counter-weighted sheaves in order to provide a time margin for releasing any wires which may become tangled. Thence it goes to the fused caustic pots in which it is annealed and cleaned. These two pots provide a total length of about 40 feet.

"After washing the wire goes to the plating cells. If necessary it may be given an anodic treatment in spent electrolyte from the zinc cells. Any sponge iron dissolved in this operation goes back to the leach plant where the dissolved ferrous or ferric sulphate is converted to zinc sulphate for return to the process.

"After plating the wire has a matte or finely crystalline surface. In order to expose as small as possible an area to corrosion the wire is rendered smooth and bright by drawing through tungsten carbide dies."

Educational Film Shows Building of Auto Engine

Recent progress in methods of producing, casting and machining steel are pictured in a new educational film produced under the supervision of the bureau of mines and now available from the bureau's experiment station in Pittsburgh. The film has its setting in the Rouge plant of the Ford Motor Co., Dearborn, Mich., and is entitled "Making a V-Type Motor."

Beginning with an airplane view of the plant, the pictorial story traces the manufacturing process from the arrival of the ore to final tests on the completed engine, with special emphasis on modern methods.

Practically every scene represents an achievement in metallurgical research, presented, however, in pictures which clearly reveal the processes used. The film is one of a series prepared by the bureau to illustrate activities in the mineral and allied industries and is available to schools, educational societies, and other interested groups.

A.F.A. Transactions in Print

Transactions of the American Foundrymen's Association, cloth, 624 pages, published by the American Foundrymen's Association, Chicago, and supplied to members for $2 and to nonmembers for $8.

This volume contains a summary of the proceedings of the thirty-ninth annual meeting of the association, in Toronto, Aug. 20-23, 1935, the minutes of the annual business meeting, and the various meetings of the board of directors throughout the year.

A major portion of the book is devoted to the technical papers presented at the Toronto meeting, with the written and oral discussion which followed. The technical papers include a symposium on "The Influence of Temperature Gradients in the Production of Steel Castings," and one on "Industrial Health Hazards and Employer Responsibility." Reports of several committees are included.

Cutting Requires More Heat

IN ORDER to keep this manganese steel cat-head in workable condition, an oxy-acetylene torch is constantly played on the metal to be removed. Because of its red hardness, the tool of Haynes-Stellite J-metal insures that there will be no loss of cutting ability. For those unfamiliar with nautical terms, a cat-head is a projection on the bow of a ship about which the anchor chain is fastened

Telling the Story in Pictures

Steam Driven Elephant

DESPITE its resemblance to an elephant or some prehistoric "monster," this is only the outer high-pressure shell casting of a steam turbine, as it appeared before cleaning, trimming and machining. It was cast in the foundry of the General Electric Co., Schenectady, N. Y., for a 40,000-kilowatt turbogenerator set

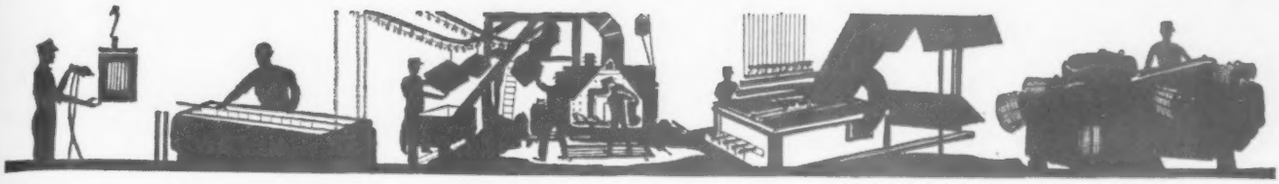
More Payload for Trailers

CONSTRUCTION of standardized light-weight, stainless steel semi-trailers, built on the principle of the Zephyr and Flying Yankee trains, has been initiated by the Edward G. Budd Mfg. Co., Philadelphia. They are built with the structural members fabricated by the shot-weld process into an integral part of the body. Through the saving in weight, the payload can be increased up to about 1½ tons over that which can be carried by the ordinary trailer

Eighteen Storage Tanks Built in One Month

THESE 5000-barrel tanks were erected at Santa Fe Springs, Calif., by the National Tank & Mfg. Co., Los Angeles. Constructed in a month, the tanks were butt-welded throughout by the shield-arc process with electrodes and equipment furnished by the Lincoln Electric Co., Cleveland. The side and covers are of 3/16-inch plate, and there are no intermediate connecting members. This greatly simplified fabrication by eliminating punching and drilling

Surface Treatment and Finishing



Etched Stainless Steel Opens New Fields to Architects and Designers

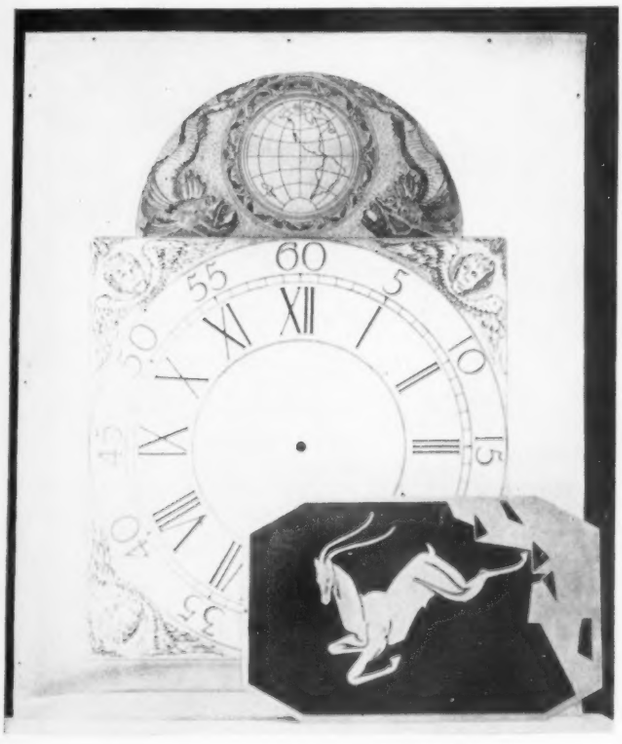
STAINLESS steel of the 18-8 chrome-nickel grade, because of its corrosion-resisting properties, is a difficult metal to etch. In general, the usual mechanical procedure of etching is applied to stainless steel using a special etching solution; a longer time is required to etch stainless steel than is required for other metals.

The pattern to be etched is first laid out on paper and inked in. It is then photographed and reduced or enlarged to the desired size. From the negative of this photograph a zinc lithograph plate is prepared, in accordance with ordinary lithographing practice, and mounted in a flat bed offset press. The plates to be etched are run through this press and coated with an asphalt-base ink, except for the design pattern, which is left bare.

As the plates leave the press they are dusted with an acid-resisting powder (powdered asphaltum or "dragon's blood"), which adheres to the damp ink. The bare metal surfaces are blown free from powder and the plates are baked in an oven to fuse the powder into a homogeneous acid-resisting coat. The backs of the plates are sprayed with an acid resisting coating, usually made up from equal parts of dammar resin and asphaltum.

The plates are now ready for the etcher who places them in racks and immerses them in the etching solution Since oxidizing agents will not etch stainless steel, a solution of ferric chloride, which has a reducing action, is used; solutions containing hydrochloric acid are also used. The etching solution is agitated either by air or by moving the plates in the solution. It usually requires about 30 minutes to etch to a depth of approximately 0.003-inch. The etched plates are thoroughly washed in running water to remove all traces of acid and then immersed in a solution of nitric acid to restore the "passivity" of the metal which is lost in the etching bath.

After the steel has been "passified" the acid resistant coating is removed with gasoline. If it is desired to fill the etched portion with a colored enamel, this is done by spraying the color before removing the protective coating. By using masks or stencils two or more colors can be applied. When the enamel has thoroughly dried, the plates are immersed for 15 to 20 minutes in a solvent which will soften the acid resistant coating without affecting the enamel. The coating is then wiped off with no difficulty, completing the entire etching process.



TWO typical examples of etched stainless steel, etched portions of which have been filled with colored enamel. These plates were prepared by the Etched Metal Co., Cleveland

• • •

New Primers for Galvanized Iron

FOR many years the difficulty of making paint adhere to galvanized iron has been recognized. Good jobs have been obtained and, for some inexplicable reason, some jobs have failed. These failures frequently occur during alternations of wet and cold weather.

A number of different methods have been used to improve adhesion, including weathering or chemical treatments which etched the surface. Although such treatments often help, they sometimes hinder adhesion by leaving behind a layer of chemical reaction products which prevent the paint from reaching the zinc.

The E. I. du Pont de Nemours & Co., Wilmington, Del., has recently placed on the market a primer which has a good record of satisfactory performance for this purpose. Like some earlier galvanized iron primers it carries zinc dust, which is present in an attached container and which is to be mixed with the balance of the paint prior to application.

The principal difference between this primer and the older primers car-

rying zinc dust is the use of a special vehicle which, together with the pigment, forms a combination which, in general, adheres satisfactorily over a long period of time and under adverse conditions to galvanized iron. It may be finished with any ordinary paint of satisfactory durability.

It must be recognized, however, that no galvanized iron primer can be considered absolutely foolproof. The zinc itself is so reactive that if weathered in acid areas or if washed with some of these etching-type preparations, a layer of reaction product may be present which will prevent the primer from reaching the zinc-coated surface. Under these conditions a careful cleaning job is necessary, such as scrubbing with an organic solvent or soap and water followed by complete removal of the soap with excess water.

Finishing of nonspangled galvanized iron has been made less difficult due to the efforts of the industry in modifying the surface to be finished. However, even after the marked advances in the surface preparation of nonspangled galvanized iron, the trade was still confronted with the fact that the average life of finishes over this metal was short as compared with that of finishes over steel.

The finishing system which is being offered by Du Pont has as its basic unit a new line of primers—the Preparakotes. The adhesion of these primers to metals is good not only to steel but also to metals which have been classified as difficult to finish, such as the substrate in question and other nonferrous metals. Then, too, adhesion does not decrease on aging as is typical of standard primers.

In addition, the primers fill and can be sanded, thus eliminating the necessity of using a different product as the surfacer. Another unusual characteristic is that they air dry satisfactorily for dry sanding and recoating in 4 hours. They are a'so resistant to peeling, blistering and failure by cold cracking. Standard top coats are used over them to complete the finishing system for nonspangled galvanized iron.

Simple Device Makes Colored Lacquers To Order in Small Lots Without Delay

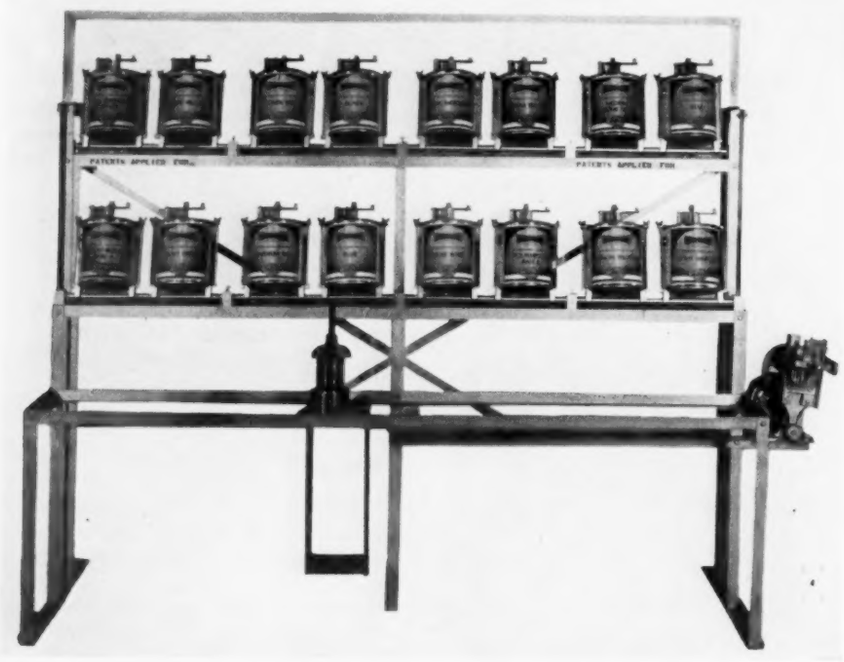
THE hundreds of colors used on automobiles during the past few years, as well as the growing popularity of bright colors in other fields, has created an acute situation among the lacquer distributors and jobbers. To maintain stocks of all the colors, many of which would never be called for, would require an investment beyond the means of many. The loss of sales and other problems which arose called for some ready solution.

The Arco Co., Cleveland, has developed and placed on the market a device known as the Arcozon production color laboratory with which jobbers can produce in quart or gallon lots any of the hundreds of standard automobile colors and many others by blending a few basic colors.

The basic colors are purchased in gallon cans and mounted in racks as shown in the accompanying illustration. Each can is hinged so that it will tilt forward and is equipped with a spout device which permits accurate control of the flow of lacquer. Color chips and formulas for each color are supplied with the equipment. If a customer requires a quart or gallon of a specific color, a quart (or gallon) can is placed in the holder shown in the center of the lower shelf. A calibrated gage is inserted and the basic colors are added in the proportions indicated by the formula card without danger of spilling or the use of measuring cups.

When all the colors have been added the cover is placed on the can which is then placed in the agitating device, shown in the lower right, where the lacquer is thoroughly mixed. It is claimed that exact colors can be reproduced at will in this manner.

The advantages of this system are obvious at a glance. Hundreds of colors are available in a few minutes time without the need for expensive inventories. As new colors become popular there is no need to purchase new stocks and, most important of all, colors which are not in demand need not be written off as a loss.



This compact rack of sixteen basic colors replaces a stockroom containing lacquers of hundreds of colors

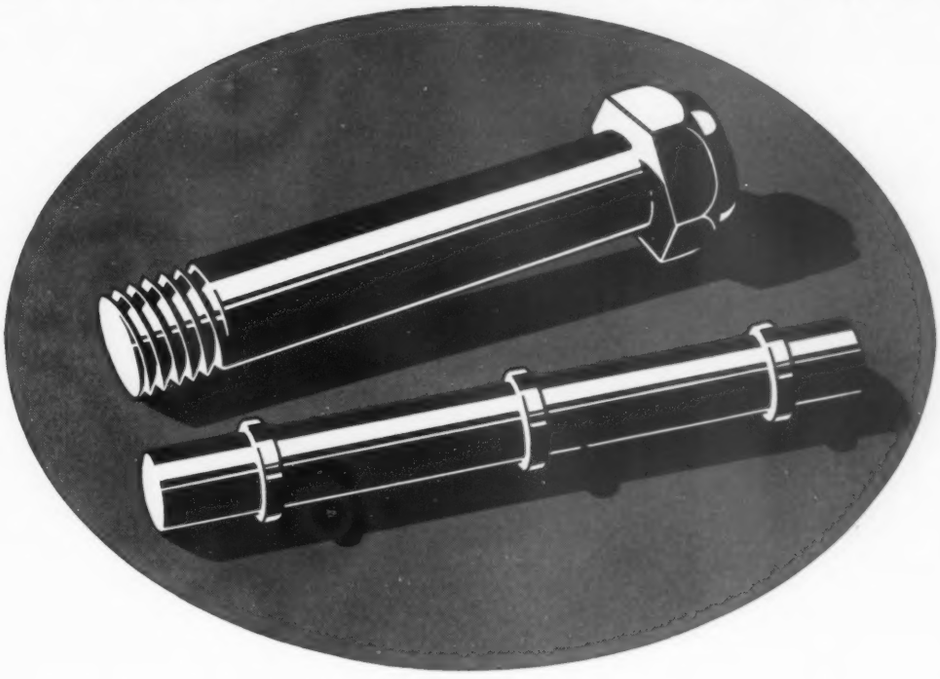
Asphalt-Base Finishes Now Available in Colors

A modified asphalt-base finishing material especially designed for use on machinery has been announced by the Asphaltum Products Co., New York. This material, known as Aspro metal finish, is available in black, and in dark shades of gray, red, green and brown. It is claimed that it is insoluble in oil and the lighter distillates of petroleum, and that caustic and other alkaline solutions, cutting compounds and most of the acids in commercial use do not affect the finish. Alcohol, water, sunlight and temperatures up to 400 degrees Fahr. have all been used in tests without damage to the metal surfaces protected by this material.

The finish may be applied by brush or spray gun and may be air-dried or baked. It dries to the touch in four hours and attains maximum hardness in 24 hours. The film is glossy and has suffcient resiliency to prevent checking, cracking or peeling, the manufacturer claims.

LONG BLANKS NEEDED

HERE'S HOW TO SHORTEN THE COST



WITH industrial expansion assuming greater proportions, the demand for long blanks is steadily and swiftly increasing. Save money—make them by the cold-forging process that reaches its peak efficiency with Manville Headers. The old-fashioned method of hot-forging wastes time, heat and material—turns a large proportion of good metal into scrap metal.

THE MANVILLE "OPEN-DIE HEADER"

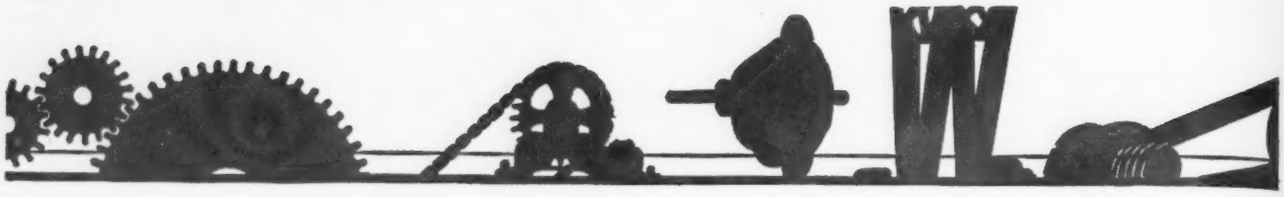
America's leading industrial companies are rapidly reducing costs and speeding production with Manville cold-forging equipment. These remarkable headers are sturdily constructed to give long continuous service and to withstand the stress of high-speed activity without a break-down. The name of Manville stands for long-life in machinery and economy in operation.

If you're interested in saving money on long blanks you'll be interested in our "Open-Die Header" that works faster. Standard sizes up to 1" x 8". Specials up to almost any size lengths. Speed up to 140 per minute. Write for full information and feel free to submit your technical problems to our engineers who will gladly help you in solving them.

MANVILLE MACHINES

E. J. Manville Machine Company, Waterbury, Conn.
CLEVELAND OFFICE: 1209 SWETLAND BUILDING

Power Drives



Council Reports Tangible Results from Campaign for Modern Group Drives

ENTHUSIASTIC endorsement of the work which has been done over the past few years in acquainting manufacturing organizations with advantages to be gained by using modern group drives featured the annual meeting of the Power Transmission council and Mechanical Power Engineering associates, at Atlantic City, N. J., May 9. It was shown that the sales curve for the power transmission industry now is pointed definitely upward. This is in marked contrast with the continued downward trend over the past decade.

Report on Activities

A report covering the history of the council and detailing its activities, by Chairman C. E. Brinley, president, Philadelphia Pulley Co., Philadelphia, revealed that some 3500 salesmen now are included in the membership of more than 60 power transmission clubs located in key cities all over the country. In each of these clubs attention is given to the solution of drive problems in plants in the district, with the result that the salesman render design and engineering service, with the sale of equipment as the secondary rather than the primary aim. As a result of such intelligent cooperative functioning, hundreds of plants today are installing modern group drives and obtaining economies and other advantages thereby.

"As a result of our activities," said Mr. Brinley, "the trend of thinking in connection with mechanical power transmission has changed entirely in this country."

During the period Oct. 1, 1934, to April 30, 1936, the council spent approximately $50,000 in advertising modern group drives in 12 business and trade publications. Mr. Brinley declared that the results of this advertising, together with the publicity on modern group drives in these and many other publications, have been impressive. The council constantly is receiving inquiries from companies interested. These are referred to the power transmission clubs in the territories where the inquiries originate, with the result that studies are made and the inquiries handled effectively.

Of great assistance in the work of educating manufacturers to the economies to be gained by proper solution of drive problems has been the appointment of regional engineers. There now are four of these regional engineers, located respectively in New England, New York, the Midwest and the South. It was indicated that plans are underway to assign a regional engineer to the Pacific Coast region. It has been found that the employment of these regional engineers has greatly increased the efficient functioning of the various power transmission clubs.

J. Edgar Rhoads, J. E. Rhoads & Sons, Wilmington, Del.; Mark M. Jones, president, Akron Belting Co., Akron, O.; D. W. McAllen, S.K.F. Industries Inc., Philadelphia, and others attested to the remarkable progress which the industry is making as a result of the work done by the Power Transmission council. Hartley W. Barclay, editor, *Mill & Factory*, New York, concurred in this appraisal of the council's work and recited many evidences of the interest and changed thinking in regard to modern group drives which have resulted.

Progress in Textile Industry

V. A. Hanson, chief engineer of the council, described the progress made in introducing modern group drives in the southern textile industry. Group drives, he said, were rapidly passing out of the picture in that industry at the time the council was formed. Careful study of the various textile drive problems has resulted in the insallation of modern group drives in a number of important weave rooms. In particular, the industry has made great progress through the development of a flywheel type of pulley for driving looms. It has been costing about $100 to equip a loom with a direct drive, said Mr. Hanson; initial cost of installing the new flywheel type pulley drive ranges from $8 to $50 per loom. Not only has the first cost thus been reduced, he said, but the drive offers other advantages.

W. R. Clendenning, regional engineer in the Middle West, mentioned many prominent companies which have made modern group drive installations as a result of the educational and engineering work conducted by the council. He reported that as a result of studies being conducted at many plants continued further progress in promoting the use of modern group drives is in prospect.

New Officers

Mr. Brinley was re-elected chairman of the council's national advisory committee, formerly known as the national executive committee. R. M. Pindell Jr., president, Alexander Bros. Inc., Philadelphia, is vice chairman. D. W. McAllen, S.K.F. Industries Inc., Philadelphia, was re-elected treasurer. Other members of the national advisory committee are E. H. Ball, president, Chicago Belting Co., Chicago; W. L. Batt, president, S.K.F. Industries Inc., Philadelphia; W. H. Fisher, vice president, T. B. Wood's Sons Co., Chambersburg, Pa.; B. A. Keiley, president, R. & J. Dick Co. Inc., Passaic, N. J.; G. C. Miller, president, Dodge Mfg. Corp., Mishawaka, Ind.; and A. F. Townsend, president, Manhattan Rubber Mfg. division, Raybestos-Manhattan Inc., Passaic, N. J.

The advertising committee of the Power Transmission council and the executive committee of the Mechanical Power Engineering associates have been consolidated as the council's executive and advertising committee. Mr. Brinley, Mr. Pindell and Mr. McAllen are ex officio members. Other members are P. C. Brown,

president, I. B. Williams & Sons, Dover, N. H.; R. W. Chandler, Graton & Knight Co., Worcester, Mass.; W. H. Fisher, vice president, T. V. Wood's Sons Co., Chambersburg, Pa.; W. W. French, Dodge Mfg. Corp., Mishawaka, Ind.; B. A. Keiley, president, R. & J. Dick Co. Inc., Passaic, N. J.; B. F. Reuther, vice president, New York Belting & Packing Co., Passaic, N. J.; J. Edgar Rhoads, J. E. Rhoads & Sons, Wilmington, Del.; and F. H. Willard, president, Graton & Knight Co., Worcester, Mass. Francis Juraschek, manager of the Power Transmission council and the Mechanical Power Engineering associates, has headquarters at 1 Atlantic street, Stamford, Conn.

It was revealed at the meeting that British manufacturers of power transmission equipment have been so much impressed by what the Power Transmission council has done for the industry in this country that they now are in process of setting up a similar organization in England.

Multispeed Polishers

PRACTICE has shown that some materials and finishes or platings polish or buff best at different speeds. With single-speed polishers or buffers, of either group or individually driven types, it is necessary to change the diameter of the buffing wheel to obtain different peripheral buffing speeds. This is inconvenient and time-consuming in plants engaged in production of work in small quantities with a wide variety of finishes or materials.

Multispeed buffers and polishers with a special change gear head attached to the motor are available which provide a choice of four speeds with increases of 10, 25 and 35 per cent above the minimum speed. The speed changes are easily and quickly obtained by shifting a speed lever. An electrical interlock prevents operation unless the gears are in proper mesh. By choosing a suitable wheel diameter any speed change may be obtained for the different work.

Similar multispeed gears are also installed on grinders to provide approximately the same speed change ratios as with polishers. On grinders, however, the change in speed is for the purpose of obtaining more nearly an average constant peripheral grinding speed as the diameter of the wheel decreases.

Use of this multispeed, totally enclosed gear changing drive has numerous operating advantages over adjustable-speed motors, according to the manufacturer, particularly with direct-current power, in the dusty atmosphere surrounding grinding, buffing and polishing equipment. The change in speed is almost as easily and quickly made as with adjustable-speed motors, the unit is totally enclosed, resulting in low maintenance, and speed changes are obtained much more simply than by changing wheels or pulleys. Since production has almost a direct relation to speed, the advantage of the proper speed is obvious.

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Know Power Costs

PLANTS with a single meter at the switchboard or on incoming power lines have difficulty in locating power wastes because there is no way of telling where the power is used. No manager would attempt to control a business, knowing only the income and disregarding how or where the money was spent. Even postage stamps are carefully charged up to the department using them.

Kilowatts cost money, too, but in many cases their cost is lumped in the overhead or charged out on some hypothetical assumption, commonly on installed capacity to use, with no knowledge of which departments or processes are wasteful or economical. One department may be idle or nearly so and still be charged proportionately the same as though it were working full force.

Where a single product is manufactured, subdivision of power costs may not be so important. However, many plants have diversified lines and true costs are more necessary, especially where competition is keen.

Each department should be metered. Then, as the consumption varies responsibility can be placed. Many process operations, particularly when relatively large electrical power consumers, may be profitably metered, too.

Seldom is it desirable to meter individual units. However, many plants make a graphic record of power consumption running idle and operating through several load cycles on a graphic recording meter when a new motor is installed. This chart is studied to determine whether the motor is the proper rating for the load and if it is operating properly, thus checking against power wastes at the time of installation. The chart is then filed for comparison with new charts should the motor show trouble later or appear heavily loaded due to changes in work.

When power costs are known standard power costs may be established, the same as other standard costs, and used as a check to maintain costs within the profitable margins.

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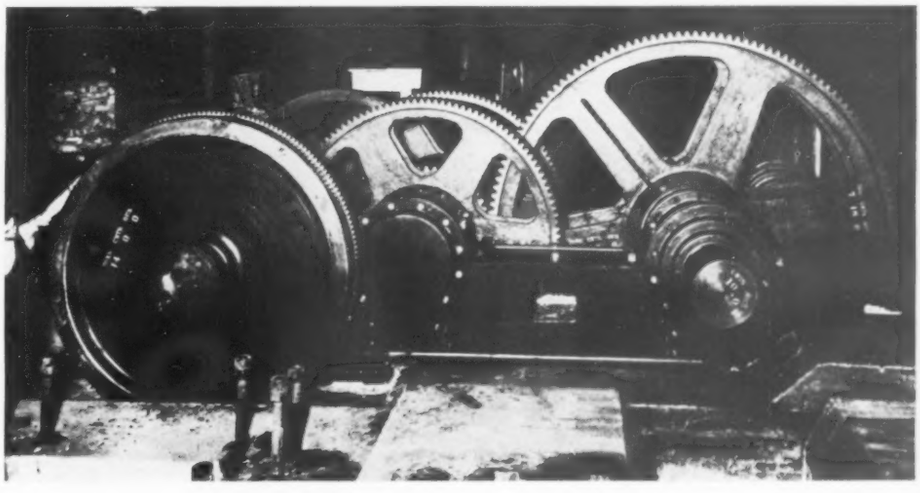
Grooves in bearings subjected to high temperatures may become filled due to carbonization. Systematic inspection is the only method of detecting such trouble. A change in bearings or lubricant is the only solution.

• • •

Worn gear teeth add a shock to the normal load. Misalignment produces increased normal stresses and adds other stresses not incurred under proper operating conditions.

Gears Drive British Mill

BRITAIN'S steel industry this year is achieving new production peaks, and demands for new and improved equipment are heavy. This large double-reduction mill drive, built by Power Plant Co. Ltd., West Drayton, Middlesex, transmits 4200 horsepower normal 15,000 horsepower peak, at 460/30 revolutions per minute. It is reported to have the largest all-welded gearcase ever produced in one piece in England

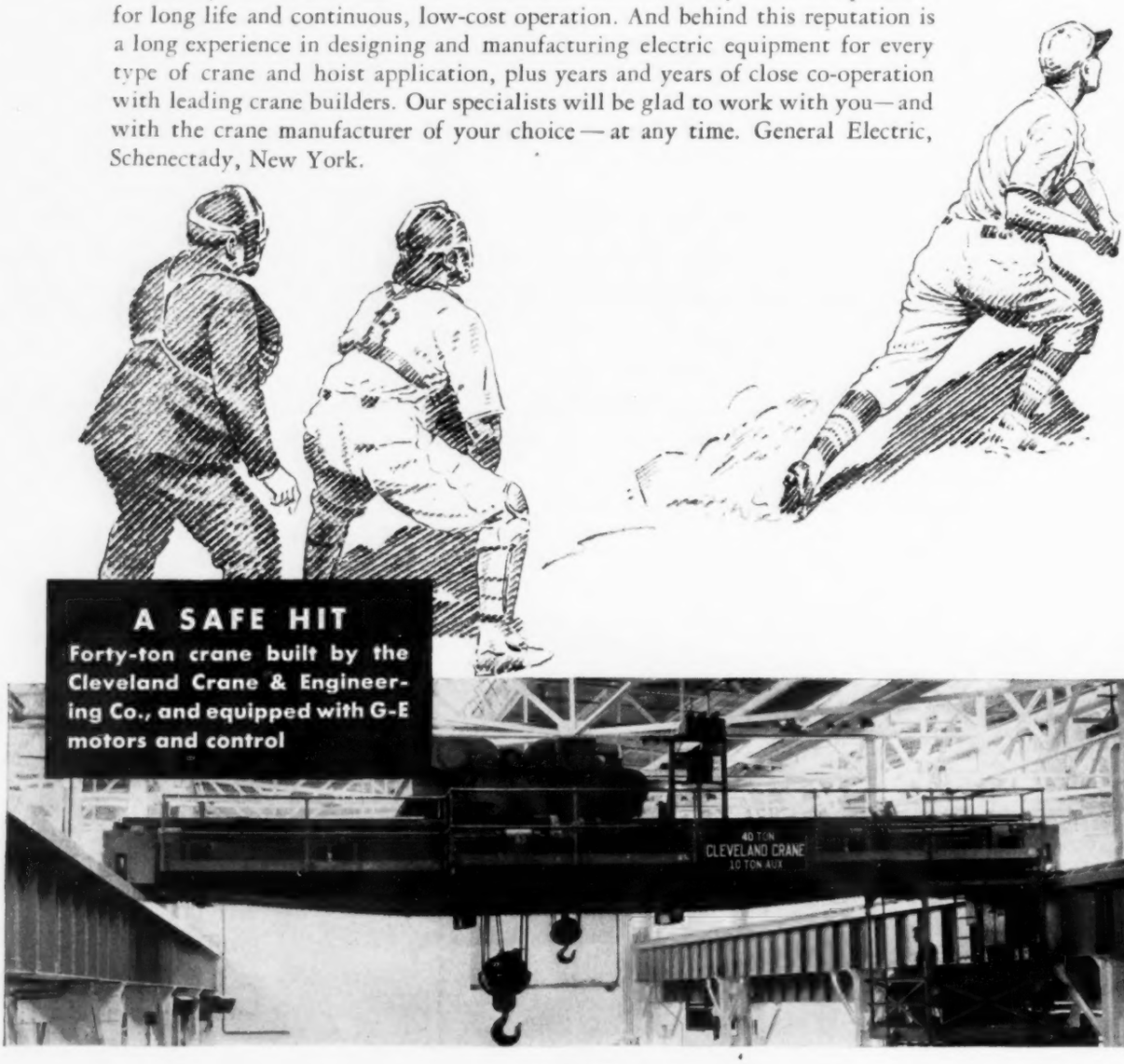


.333 IS A GOOD AVERAGE IN BASEBALL!

A PLAYER who can make a "safe hit" once in every three times at bat can find a berth on any baseball team in the country. But a plant executive cannot afford to make a profit-returning selection of plant equipment only once in three installations. When there is a considerable expenditure involved, he cannot afford to take a chance—he has to "hit the ball" every time.

A traveling crane is not only a substantial investment in plant equipment, but it is many times a vital factor in meeting a production schedule. Can you afford to risk profit-strangling shutdowns and high maintenance brought about by the failure of the electric equipment on your crane?

But here is a sure way to obtain a profit-building installation of electric equipment for your crane: choose G-E motors and control — they have a reputation for long life and continuous, low-cost operation. And behind this reputation is a long experience in designing and manufacturing electric equipment for every type of crane and hoist application, plus years and years of close co-operation with leading crane builders. Our specialists will be glad to work with you—and with the crane manufacturer of your choice — at any time. General Electric, Schenectady, New York.



A SAFE HIT
Forty-ton crane built by the Cleveland Crane & Engineering Co., and equipped with G-E motors and control

011-94

GENERAL ELECTRIC

Methods and Materials

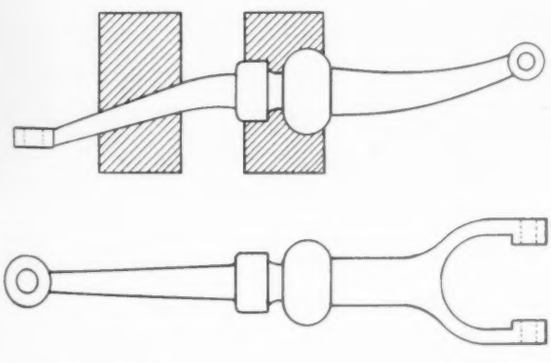
Forging Error Corrected By Electric Butt Welder

Not long ago, an error was made in a plant making parts for a well-known automobile. A forging die for a yoke-shaped clutch release had been completed and several thousand forgings struck off before it was discovered that one part of the piece was several degrees out of line. This caused a particularly bad headache. Since forging dies are costly and since the cost of the parts already forged and ready for finishing was a considerable item, the question arose as to what to do.

The combination of a bright idea and an electric resistance butt welder, however, turned this mistake into little more than an unpleasant experience. The forgings were clamped in the welder, a machine built by the Thomson-Gibb Electric Welding Co., Lynn, Mass., through use of a simple die to take care of the angle and were heated to a temperature of 1200 to 1500 degrees Fahr. Then they were bent to the exact angle required for any one of several car models by a simple fixture, as shown in the accompanying illustration. Heating and bending in this way did no harm to the forging.

This solution, it is stated, proved completely satisfactory in more ways than one. It salvaged the stock of forgings on hand, and it provided a way to substitute one standard die for several, since any desired angle could be produced by this method.

Actual cost to the manufacturer was small, because the equipment used was a standard machine that could be adapted to many other operations by adding motor controlled pressure devices or air-operated clamps. In other words, if it is figured that the cost of the butt welder was canceled by its usefulness on other work and the fact that it saved the cost not only of a faulty die but several others, then the net cost to the parts maker was only the cost of current for heat.



SEVERAL thousand automotive forgings, made several degrees out of line because the die was in error, were salvaged by heating them in an electric resistance butt welder and bending them to correct shape in a simple fixture

\$ \$ \$

Alloy Steel Pistons Cast In Horizontal Position

After extensive experiments, an automobile manufacturer has discovered that the most satisfactory method of producing alloy steel pistons is to cast them in a horizontal position and entirely in green sand. Apparently defying the laws of gravity and liquid pressure, the green sand core attached to the drag part of the mold does not move. The pistons are cast eight in a mold and held to a tolerance of 0.003-inch in thickness.

\$ \$ \$

New Bolt Package Wins Award in Competition

A new package for bolts and nuts, developed within its own organization, won second highest award for Lamson & Sessions Co., Cleveland, in the recent All-American package competition in New York.

The new bolt carton, shown in the accompanying illustration, is of tough brown boxboard, testing three times stronger than cartons used previously. Its outstanding feature is its appearance, for the entire carton, which is of the so-called full-telescoping type, is covered by a pattern of bolts, nuts, cotters, rope, clips, plow bolts, semifinished and castellated nuts, stove bolts, etc., printed over the outside. Copyright notices

appear conspicuously here and there on the carton, and patents are applied for by the bolt company, the all-over design serving as a trademark for the line of products of this manufacturer.

This new carton is now being supplied jobbers who are rapidly putting it into the hands of dealers. Aside from occasional changes in label designs and colors, Lamson & Sessions' executives say it is the first departure in package design in the bolt industry in three-quarters of a century.

\$ \$ \$

High-Strength Steel Cuts Transmission Tower Cost

Use of high-yield strength, low-alloy steel recently made possible an important reduction in the cost of constructing a power transmission line in a mountainous section of West Virginia. The site was substantially a wilderness, removed from railroads and devoid of roads other than

mountain trails. Hence a large part of the expense of construction was that incurred in delivering the transmission tower material to the site. By the use of high-strength steel, weight of the heavy corner angles of the towers was reduced some 30 per cent, with a corresponding saving in the expense of handling the material over the rough terrain.

Gasoline Pumps, Combining Beauty with Dependability, Are Mainly of Steel

GASOLINE pumps which combine beauty of appearance with dependable functioning are well recognized by oil companies as important units in their marketing effort. One such pump, shown in the accompanying illustration, has been designed particularly from the standpoint of price appeal. Built by the Wayne Co., Fort Wayne, Ind., with the collaboration of an industrial designer, Harold L. Van Doren, Toledo, O., it is of the computing type. Its dial shows after each sale, computed on the basis of the prevailing price per gallon, the price for the gasoline delivered to the customer's car.

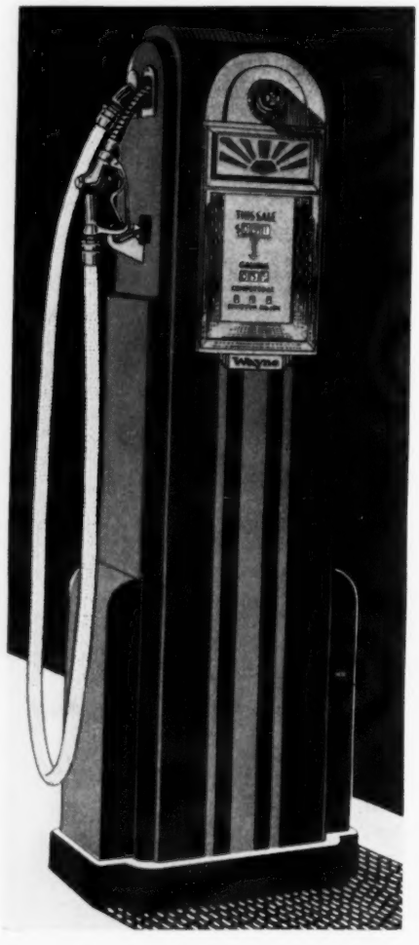
This pump, having an overall height of 75½ inches and weighing 520 pounds, is built largely of rolled steel, semisteel castings and die castings. The skeleton consists of a semisteel base casting to which are fastened four corner posts formed on special rolls from hot rolled, pickled, strip steel. To the corner posts are spot welded mounting brackets which are die formed from hot rolled, pickled, strip steel. To the top of the corner posts are fastened two die cast arches.

Visible Flow Indicator

On top of the corner posts is mounted a "bull's-eye" body; this is a semisteel casting through which the gasoline flows, indication of the flow being obtained by means of a spinner mounted on each side of the pump and enclosed in a glass "bull's-eye." To the bull's-eye a semisteel discharge casting is bolted. Pump and motor support, meter support and computor support are semisteel castings which contain 15 to 18 per cent steel, resulting in strong, close-grained castings. These supports are bolted to the support brackets spot welded to the corner posts.

To the two arches mounted on top of the corner posts, the pump dome is fastened. This dome is die formed in one piece, of extra deep drawing, full pickled, cold rolled, reannealed and oiled sheet steel. The pump body, a semisteel casting with a semisteel rotor equipped with formica blades and actuated by a stainless steel shaft, is bolted to the pump support. To this support is also bolted the explosion-proof motor for driving the pump. Both the pump pulley and motor pulley are of steel, consisting of two die-formed parts which are spot welded together.

The meter, which is bolted to the meter support, consists mostly of die cast parts, with the exception of the dome which is a semisteel casting. The computer is fastened to the computer supports and also is made up primarily of die castings, with some steel and brass. The housings which are fastened to the corner posts are all die formed. The front housings are made of 2-pass, cold rolled steel.



Unusually attractive appearance features this gasoline pump, made of rolled steel, semisteel castings and die castings. Of the computing type, the dial shows after each sale, based on the prevailing price per gallon, the amount to be paid by the customer

The upper and lower housing assemblies are made of extra deep drawing, full pickled, full cold rolled, reannealed and oiled sheet steel. The lower housing is of 2-pass cold rolled steel. The bezel, which encloses the computer dial, is die formed from 2-pass cold rolled steel.

High-Pressure Steam Test Results Are Published

Steam generation at high pressures and temperatures has been the subject of a study made by the engineering experiment station of Purdue university, Lafayette, Ind. The results of this work have recently been written in brief form and published as bulletin 52 of the research series by the university. Design and construction of the generator and the control system built for it are discussed, and results of tests on the generator are given. Thermal properties of steam above 2500 pounds pressure were investigated because of the disagreement in tables now existing. Studies were made and results tabulated in flow distribution and on the viscosity of water and superheated steam. At present further studies are under way on the reaction between steam and different metals at elevated temperatures.

Couplings Eliminated in Casings for Deep Drilling

Use of couplings in casings for deep drilling has been eliminated by a development of the Hydril Co., Los Angeles. This company upsets the ends of the pipe, slightly increasing the diameter, and then cuts a double-step square casing thread directly into the upset. The ends screw up tight forming both inside and outside fluid seals and the tapered shoulders of the upset portion support the joint in bending.

The thickness of the upset is varied to meet the demands of the operator for joint strength and clearance. As an example: 8 5/8-inch 38-pound casing upset to 9⅛ inches has been furnished for strings of pipe 8000 and 8500 feet in length. 6 5/8-inch 28-pound casing upset to 7 inches has been used in strings 10,000 feet in length.

Modern Testing Equipment In New Control Laboratory

A new chemical and metallurgical testing and production control laboratory has been placed in service by the Ford Motor Co., Dearborn, Mich.

Completely air-conditioned and furnished with new X-ray, physical testing and chemical analysis equipment, the laboratory is used to analyze the molecular structure of

World's Largest Power Shovel Has Axles and Castings of Vanadium Steel

As one would naturally expect, the designers of the world's largest power shovel gave very careful consideration to the selection of steel for those most vital parts — the axles.

Consider the severity of the service. The shovel is equipped with a 32 cu. yd. dipper — fully 2 cu. yds. larger than any similar bucket. Think of the stresses and strains as the shovel is propelled over uneven ground . . . as the hoisting drum shaft transmits the enormous power of the motors.

For the axles of the world's largest power shovel, Marion Steam Shovel selected a Vanadium Steel. Likewise, they chose Vanadium Cast Steel for the swiveling castings for the crawlers on each corner.

If you have a job that calls for exceptional strength and toughness — a steel forging or a steel or iron casting that must withstand severe stresses, perhaps Vanadium will help you solve your problem. The Metallurgical engineers of the Vanadium Corporation of America are at your service.

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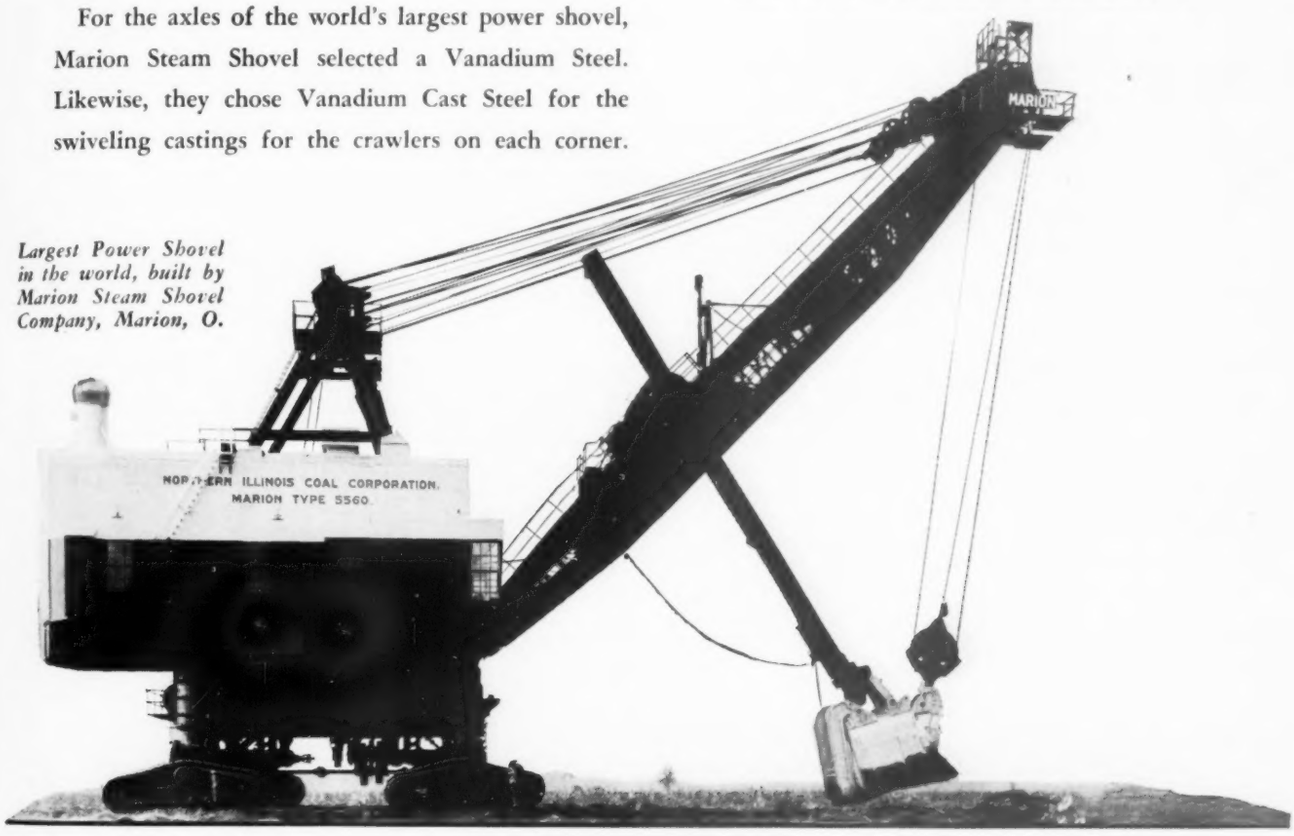
VANADIUM CORPORATION OF AMERICA
420 LEXINGTON AVENUE, NEW YORK, N. Y.

Plants at Bridgeville, Pa., and Niagara Falls, N. Y.
Research and Development Laboratories, Bridgeville, Pa.



Largest Power Shovel in the world, built by Marion Steam Shovel Company, Marion, O.

Vanadium Steels

FOR STRENGTH · TOUGHNESS · DURABILITY

METALS VANCORAM ALLOYS

FERRO ALLOYS
of vanadium, silicon, chromium, and titanium, produced by the Vanadium Corporation of America, are used by steel makers in the production of high-quality steels.

steels, to determine the physical properties of metals and fabricated parts, and to analyze steels, irons and other metals; textiles, paints, oils, and rubbers used in the factory.

Included in the equipment is a new X-ray machine having an oil-cooled fine focus radiographic tube of 230,000-volt capacity. It has sufficient intensity to penetrate 4 inches of steel, and through its use flaws less than 2 per cent of total thickness are detected. Its intensity permits a great time saving in making X-ray photographs, a crankshaft, for example, being photographed in about 3 minutes.

The X-ray department also includes a diffraction machine equipped with a new tube which will obtain in 20 minutes pictures which formerly required from 24 to 70 hours of exposure. The machines are used largely in research to improve casting and steel treating technique through a study of the atomic structure of the finished steels and various alloys.

Another new instrument in the laboratories is the profilograph, designed at the University of Michigan. It is used to examine steel finishes. Through an optical magnifying system, any imperfections in the finish which are detected by a diamond point are magnified 2000 times vertically and 64 times horizontally. Thus the graph of a surface of a ⅛-inch specimen of steel becomes a readable chart 8 inches long, with minute irregularities showing as deep ridges.

Open Steel Deck Replaces Wood Floor in Flood-Torn Bridge

WHEN the recent Pittsburgh flood floated away the wood deck of a bridge over Nine Mile run the residents beyond were isolated until the span could be put back into service. Speed of repair was essential but it was also necessary that the repair be permanent and adequate to take care of whatever traffic the original girders could accommodate.

The problem was solved by the use of Blaw-Knox-Irving steel bridge floor which effected the permanent repair in three weeks and also increased the capacity and safety of the bridge.

The accompanying illustration shows the new floor nearing completion. It gives a close view of the detail of the main and secondary members and illustrates the method of splicing the sections together to make the main members continuous from end to end of the span.

The arrangement of longitudinal carrying members and transverse spacing members is carefully designed for safety not only of wheeled traffic, but also of horses and other draft animals.

The longitudinal members are of 2½ inches x $\frac{3}{16}$ inch steel having a yield point of 47,000 pounds per square inch. They are spaced on 2½-inch centers. The spacing members are 1¼-inches x $\frac{3}{16}$-inch and are riveted to the longitudinal members at every intersection. The floor is delivered to the bridge in units approximately 25 inches wide by 25 feet long.

The ends of the longitudinal members are staggered two spaces of the transverse members and are offset 6 inches from the end so that the lap joint rivets together making the grid continuous for as long a distance as is desired. The joints between adjacent sections are made by riveting the longitudinal bar side of one section to the transverse bar side of the adjacent section as the floor is laid. Thus, when the floor is finished, the joints of the longitudinal members are the only ones that are apparent, the others being the same as the joints between factory-assembled parts.

Installing new open steel flooring on a bridge over Nine Mile run in Pittsburgh

New Steel for Applications Involving High Temperature

Timken Steel & Tube Co., Canton, O., has announced a new steel designated as "Silmo", especially designed for applications where an economical combination of high-temperature strength and oxidation resistance is required. In the temperature range of 1000-1200 degrees Fahr. the new steel is claimed to have about twice the strength of carbon steel and its oxidation resistance compares favorably with that of 4-6 per cent chrome-molybdenum steel.

This new steel may be used to replace carbon steel where greater safety is required and as a substitute for the standard carbon-molybdenum steel where oxidizing conditions are encountered. Indicated uses lie in the field of cracking furnace tubes, pipe still heater tubes, high-pressure boiler and superheater tubes, and tubing used in the manufacture of air heating equipment.

Complete physical data covering high-temperature tensile properties, Charpy value at elevated temperatures, heat embrittlement tests, creep strength, temperature-stress embrittlement tests, stability, and corrosion and oxidation resistance, together with curves showing the creep strength at various temperatures and the relation between creep strength and rate of creep at 800, 1000 and 1200 degrees Fahr. are presented in a series of six looseleaf pages available on request to the Timken company.

Map Shows Location of Metropolitan Districts

Map of Metropolitan Districts of the United States; available in two sizes, 22 x 17 inches and 54 x 42 inches; paper, cloth back, panel board back, or roll type; published by J. H. H. Muirhead, New York; supplied by STEEL, Cleveland, at prices ranging from $1 to $17.50; in Europe by Penton Publishing Co. Ltd., Caxton House, Westminster, London.

This 1936 map, printed in color or without color in the smaller size and

in color in the larger size, is based upon the classification of metropolitan districts by the department of commerce. A glance shows the points at which nearly half the population of the United States is concentrated. In place of the customary dot to represent a city, the size and shape of each city along with its suburbs are drawn to scale.

Since there is no definite meaning for expressions Mountain states, Middle Atlantic states, etc., the map is divided by color into the nine geographic divisions of states as established by the bureau of census and used by other departments of the government. The United States postoffice has announced an official list of abbreviations for the names of states and these are reproduced in the table of geographic divisions.

The bureau of census defines a metropolitan district as having a population of 100,000 or more and containing one or more central cities of 50,000 or more inhabitants. Metropolitan districts include all adjacent civil divisions (suburbs) having a density of not less than 150 inhabitants per square mile. The 96 metropolitan districts cover only 1.2 per cent of the land area of the United States but contain 45 per cent of the population.

Midwest Welding Show Plans Nearing Completion

Preparations for a Midwest Welding Conference, to be held at 2211 West Pershing road, Chicago, June 4-5-6, are approaching completion. Manufacturers of welding equipment have contracted for exhibit space where they will demonstrate the latest developments in welding and answer questions.

Several authorities on arc welding, gas welding, gas cutting and related subjects will give talks on recent developments in their respective fields. Although the program has not been finally arranged, the following have been invited to participate: Thomas Jones, Illinois Steel Co.; R. R. Royal, Illinois Central railroad; L. C. Munroe, *The Welding Engineer;* A. M. Candy, the Hollup Corp.; W. W. Reddie, Westinghouse Electric & Mfg. Co.; J. H. Blankenbuehler, Westinghouse Electric & Mfg. Co.; Ernest Wanamaker, Rock Island railroad; Louis J. Larson, A. O. Smith Corp.; E. L. Quinn, American Manganese Steel Co.; and R. C. Fisher, American Steel & Wire Co.

The conference is sponsored by the Hollup Corp. in co-operation with American Brass Co., American Manganese Steel Co., American Steel & Wire Co., Compressed Industrial Gases Inc., *The Welding Engineer* and Westinghouse Electric & Mfg. Co.

Welding, etc. . . .

by Robert E. Kinkead

IN THIS column, the author, well-known consulting engineer in welding, is given wide latitude in presenting his views. They do not necessarily coincide with those of the editors of STEEL.

Structural Steel Welding

RECENT work on a code covering welding on structural steel for bridges and buildings reveals the almost insuperable difficulties in the way of writing a code that is fair to everyone. An ever-present source of trouble is that knowledge of welding technique is not widely disseminated as it is developed. Thus, the carbon content of structural steel which is to be welded is limited to 0.25 per cent where no heat treatment can be applied. Yet, with proper welding technique, 0.35 per cent carbon steel can be welded and the job will be better than 0.25 per cent carbon steel if with the latter special measures are not adopted to recrystallize the metal in the zone where crystal growth is greatest—no formal heat treatment being involved in either case. The problem was solved 15 years ago by a Cleveland crane builder. The code writers simply did not know about it.

A code for structural steel welding is an absolute necessity. But, the best code that can be witten will contain many absurdities. The experience of the A.S.M.E. with its Boiler Code committee over a long period of years before it took on the job of writing a code for welding made possible its conspicuous success with welding. This committee works year in and year out revising its code. It is never considered perfect; it always needs to be changed. It is an expensive and man-killing job. But without prompt and frequent revision, any code does more harm than good.

Sparks and Flashes

GERMAN RAILWAY engineers go for plug welding in a large way to reduce warping due to welding heat. In this country, plug welding is avoided wherever possible. The stress concentrations under load around a plug weld are objectionable to a high degree if the structure is subjected to dynamic loading, repeated application of the stress, or alternating stress. The weld metal in the plug is usually dirty and porous as well as poorly fused in most cases of small plugs. Aside from these objections, plug welding is a good theory.

* * *

HAILE SELASSIE announced early in the war that he would take his place at the head of his warriors. He did that very thing recently on his way to a British warship with all the gold he could readily lay his hands on. He was careful to stay far enough ahead of his warriors to keep them from catching him. Italians are starting negotiations to buy a large tonnage of steel for water and sanitation projects to clean up Haile's plague-ridden country.

* * *

AN EFFICIENCY ENGINEER inquires what can be done with the 5000 tons of stub ends of welding rods which will be wasted in 1936. Since this involves roughly 500,000,000 stubs, we have taken the matter up with Harry Hopkins to organize a boondoggling expedition to just pick up the pieces. After they are picked up at a cost of about $25 per ton, they may be sold for $15 per ton, leaving a "social profit" of $10 per ton for Mr. Hopkins.

* * *

THE VICE PRESIDENT IN CHARGE OF SALES of a prominent Cleveland welding machine manufacturer recently bought a farm in northern Ohio which is suitable for raising horses. Horse traders thereabouts who have carried on the noble traditions of their calling think they are pretty good but they will probably find that welding sales managers know about horse trading. Presently someone will suggest that there ought to be a law to protect the horse traders from unfair competition.

AMONG THE PLUS + FACTORS IN BETHLEHEM PIPE

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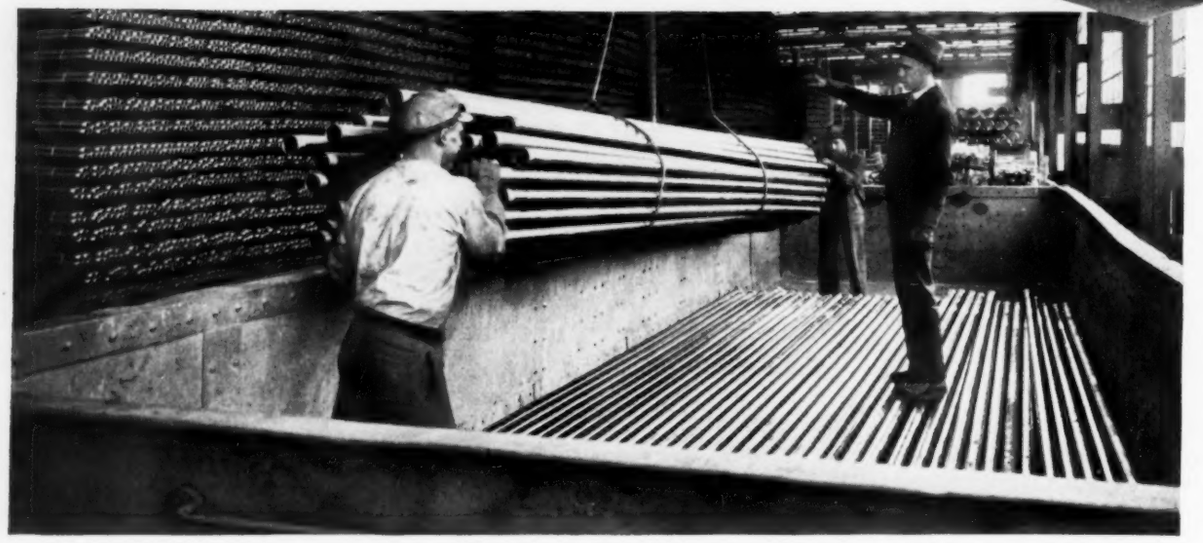

but we do in *shipping* it

BETHLEHEM PIPE isn't made in a hurry. Production moves along at a steady, even pace. This is one of the reasons for the presence in every length of the plus factors that make Bethlehem Pipe so economical to install and so satisfactory in the service that it gives.

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Symposium on Radiography, X-Ray Tests To Feature Annual A.S.T.M. Meeting

PROGRAM has been announced for the thirty-ninth annual meeting of the American Society for Testing Materials, to be held June 29-July 3 at Chalfonte-Haddon hall, Atlantic City, N. J. Many of the sessions will be of particular interest to fabricators of iron and steel and other metals.

Probably the most significant feature of the meeting will be a symposium on radiography and X-ray diffraction. This will be one of the most extensive symposiums ever arranged by the society and will comprise four separate sessions with a total of 12 papers on the subject.

A highlight of the session on iron and steel will be the report of several years' research at the bureau of standards in determining the cause of failure of heat treated wire used in the Mount Hope suspension bridge and why cold drawn wire, substituted for the heat treated wire after the bridge was dismantled, is satisfactory.

The eleventh Edgar Marburg lecture will be delivered by Dr. Arthur L. Day, director of the geophysical laboratory at the Carnegie Institution of Washington and an authority on the subject of glass technology.

Summary of technical papers scheduled for presentation, which may interest readers of STEEL, is tentatively as follows:

Tuesday, June 30

MORNING

Report of committee E-10 on standards.
Report of committee E-9 on research.
Annual report of executive committee by C. L. Warwick, secretary-treasurer.
"Relationship of A. S. T. M. to Modern Developments in Chemical Engineering," by H. C. Parmelee, editor, *Engineering and Mining Journal.*
Presidential address by H. S. Vassar.
Introduction of newly elected officers.

AFTERNOON

Fuels

Report of committee D-3 on gaseous fuels.
Report of committee D-5 on coal and coke.

Symposium on Radiography and X-Ray Diffraction Methods—Radiography

"Principles of the Radiographic Problem," by J. T. Norton, Massachusetts Institute of Technology.
"Foundry Applications of Radiography," by Earnshaw Cook, American Brake Shoe & Foundry Co.
"Application of Radiography to the Welding Art," by J. C. Hodge, Babcock & Wilcox Co.

EVENING

Symposium on Radiography and X-Ray Diffraction Methods—Radiography (continued)

"Miscellaneous Applications of Radiography and Fluoroscopy," by H. E. Seeman, Eastman Kodak Co.
"Gamma-Ray Radiography and Its Relation to X-Ray Radiography," by N. L. Mochel, Westinghouse Electric & Mfg. Co.
"Problems of Radiographic Specifications," by H. H. Lester, Watertown arsenal.

Water

Report of joint research committee on boiler feed water studies.
Report of committee D-19 on water for industrial uses.
"Effect of Solution Composition on the Failure of Boiler Steel Under Static Stress at 250 C," by W. C. Schroeder, A. A. Berk and E. P. Partridge.
"Interpretations of Published Studies on the Cracking of Steel," by D. S. McKinney, Duquesne Light Co.
"Use of Solubility Data to Control the Deposition of Sodium Sulphate or Its Complex Salts in Boiler Waters," by W. C. Schroeder, A. A. Berk and E. P. Partridge.

Wednesday, July 1

MORNING

Corrosion, Effect of Temperature, Creep

Report of committee A-10 on iron-chromium-nickel and related alloys.
Report of committee A-5 on corrosion of iron and steel.
Report of committee B-3 on corrosion of nonferrous metals and alloys.
Report of joint committee on exposure tests of plating on nonferrous metals.
Report of joint research committee of A. S. M. E. and A. S. T. M. on effect of temperature on the properties of metals.
"Slow-Bend and Impact Tests of Notched Bars at Low Temperatures," by H. F. Moore, H. B. Wishart and S. W. Lyon, University of Illinois.
"Creep Test Machine," by F. H. Morehead and J. J. Curran, Walworth Co.
"Influence of Time at 1000 Fahr. on the Characteristics of Carbon Steel," by A. E. White and C. L. Clark, University of Michigan, and R. L. Wilson, Timken Steel & Tube Co.

Symposium on Radiography and X-Ray Diffraction Methods—Radiography (continued)

"Equipment and Methods," by C. S. Barrett, Carnegie Institute of Technology.
"Constitution of Alloys," by K. R. Van Horn, Aluminum Co. of America.
"Chemical Analysis," by W. P. Davey, Pennsylvania State college.

AFTERNOON

Symposium on Radiography and X-Ray Diffraction Methods—Radiography (continued)

"Cold Work, Recrystallization, and Preferred Orientations," by J. T. Norton, Massachusetts Institute of Technology.
"Particle Size Determinations," by G. H. Cameron, Hamilton college, and A. L. Paterson, Massachusetts Institute of Technology.
"Non-Metallic Applications," by G. L. Clark, University of Illinois.

Marburg Lecture

"Developing American Glass," by Dr. Arthur L. Day, director, geophysical laboratory, Carnegie Institution, Washington.
Award of Dudley medal to H. C. Mann.

EVENING

Spectrographic and Chemical Analysis

Report of committee E-3 on chemical analysis of metals.
Report of committee E-2 on spectrographic analysis.
"Spectrographic Determination of Small Quantities of Arsenic in Lead, Copper and Their Alloys," by Frances W. Lamb, Bohn Aluminum & Brass Corp.
"Spectrochemical Analysis of Nickel Alloys for Various Additions or Impurities," by C. J. Neuhaus, International Nickel Co. Inc.
"Spectrographic Determination of Magnesium in Aluminum Alloys," by W. R. Koch, U. S. Army Corps, Wright Field.
"Developments in the Quantitative Analysis of Solutions by Spectrographic Means," by O. S. Duffendack and K. B. Thomson, University of Michigan.

Testing, Fatigue of Metals

Report of committee E-1 on methods of testing.
Report of sectional committee on specifications for sieves for testing purposes.
"Applications of the Wedge Extensometer," by W. M. Wilson, University of Illinois.
"High Velocity Tension Impact Tests," by H. C. Mann, Watertown Arsenal.
Report of committee D-15 on thermometers and laboratory glassware.
Report of research committee on fatigue of metals.
"Damage and Overstress in Fatigue of Ferrous Materials," by H. W. Russell and W. A. Welcker Jr., Battelle Memorial institute.

Thursday, July 2

MORNING

Iron and Steel

Report of committee A-3 on cast iron.
Report of committee A-2 on wrought iron.
Report of committee A-6 on magnetic properties.
Report of sectional committee on standardization of dimensions and material of wrought iron and wrought steel pipe and tubing.
Report of committee A-1 on steel.
"Failure of Suspension Bridge Cable Wire," by W. H. Swanger and G. F Wohlgemuth, national bureau of standards.
"High Speed Impact Tests on Bolt Steel," by D. S. Clark and G. Datwyler, California Institute of Technology.
Report of joint committee on investigation of effect of phosphorus and sulphur in steel.

Friday, July 3

MORNING

Nonferrous Metals, Metallography

Report of committee B-1 on copper and copper alloy wires for electrical conductors.
"Torsion and Flexure Testing of Copper Wire," by S. E. Borgeson, general research laboratories, General Cable Corp.
"Effect of Time on Tensile Properties of Hard-Drawn Copper Wire," by A. J. Phillips and A. A. Smith Jr., American Smelting & Refining Co.
Report of committee B-5 on copper and copper alloys, cast and wrought.
Report of committee B-4 on electrical-heating, electrical-resistance and electrical-furnace alloys.
"Bend Testing of Wire for Vacuum Tubes," by D. A. S. Hale and W. J. Farmer, Bell Telephone Laboratories Inc.

(*Please turn to Page* 61)

Progress in Steelmaking

Oil Prevents Peak Loads

At a plant where composition bearings are used on the roll necks the practice when shutting down the mill for a period of several hours or more calls for a coating of black oil on the roll necks and turning over the rolls once or twice. This arrangement prevents peak loads on the motor when the mill is started up.

• • •

Affords Dual Protection

Although the principal use of fabric-base laminated bearings has been on roll necks, there are various other applications within the steel mill. They can be used with water lubrication on roll of runout tables and on centrifugal pumps. With a small amount of lubrication they can be used on cranes and for other purposes at sheet and tin plate departments where drippage of oil must be avoided.

• • •

Eliminates Acid Sludge

Disposal of acid sludge deposited in the benzol washers at a plant in the Great Lakes district has been a problem inasmuch as the material is an objectionable waste product and inflammable. Present practice includes placing it in a settling basin beneath the coke quenchers adjacent to the compartment for coke breeze and neutralizing it with lime waste from the ammonia-freeing still. The mixture, however, partly destroyed the basin and dug holes into the earth through which the materials seeped. Revisions now are being made to accommodate the Ufer process for treating light oils in the benzol washers which will eliminate the acid sludge. The neutralization disposal then will not be required, and the ammonia still can be eliminated without loss since as much ammonium sulphate as is desired may be procured from precipitation of the free ammonia contained in the gas when it passes through the saturators.

• • •

Coating Stands Hard Usage

A new nontoxic, tasteless, odorless and nonporous coating has been developed for use on metal surfaces such as washing machine lids, dispensing cabinets, laboratory equipment and other surfaces subjected to hard usage. The finish withstands bending, drawing and other forming press operations without marring or cracking. The coating is applied by spraying or rolls and is baked at temperatures depending upon the fabricating requirements.

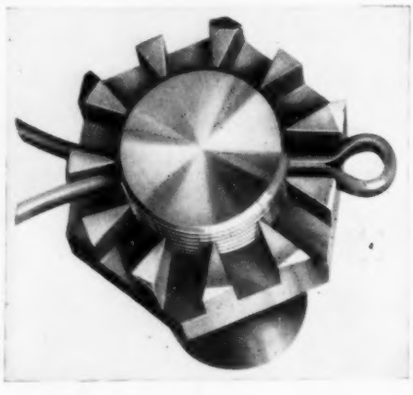
• • •

Aids Corrosion Resistance

According to an investigation conducted in Germany, a phosphorous content of steel exceeding 0.06 per cent increases appreciably the corrosion resistance of copper-bearing steels. This, it is believed, is proof that the solubility in acids gives an entirely misleading picture of the actual resistance to corrosion of a particular steel. A comparatively high content of phosphorous greatly improves the corrosion resistance of copper-tin steels. In the exterior appearance the phosphorous content in copper bearing steels produces a dark brown, smooth, pit-free protective layer of corrosion products, and on account of the preservation and stability of this surface a comparatively high content of phosphorous in copper bearing steels has a particular favorable effect on the maintenance of the mechanical rigidity, as for instance in wire for fencing.

Newly Developed Slotted Nut Affords Micromatic Adjustment

CLOSE adjustment features a newly developed slotted nut known as the Cooke micro nut which offers from 10 to 22 adjustment per turn (depending on size) instead of the usual 6 per turn. This micromatic adjustment is achieved by locating the keying wedges off center from one another so that two keying positions are possible for each slot. At keying position, a wedge centers the hole. If hole and wedge are not in keying position at first trial, a slight tightening will bring a wedge into position at one end or the other of the hole, for the key can be inserted from either end. Because of this closer adjustment (from 0.008 to 0.013-inch, depending on size), there never is an occasion for backing off the nut to get a keying position, or of tightening with shims. The key is set by simply tapping it in with a hammer. No pliers are needed. The key spreads automatically, curving outward, and filling the space between wedge and sides of the hole, locking bolt, nut, and key immovable. A special key accompanies each nut. The end of the key is trimmed off to an internal V-shape so that it spreads readily around the keying wedge on the nut, never catching on the wedge. The smoothly curved shape of the key when set gives the slotted nut a neat, workmanlike appearance when installed. Production of the new nut has been started by the Blatchford Corp., 80 E. Jackson boulevard, Chicago



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Examine Effect of Copper on Various Types of Cast Iron

CONCLUDING reports of technical sessions incident to the fortieth annual convention of the American Foundrymen's association in Detroit, May 4-9, are presented below. Formal papers, roundtable discussions and daily shop operation forums made a full schedule, only part of which can be abstracted here

SESSIONS ON CAST IRON

L. W. EASTWOOD, Houghton, Mich., presented a paper on copper and copper-manganese in cast iron, prepared in collaboration with C. T. Eddy and A. E. Bousu, associates in the Michigan School of Mines and Technology. They summarized the results of an investigation on the use of copper in cast iron, and indicated that copper alone increases hardness, compressive strength and tensile strength, but has a slight adverse effect on tranverse properties. Most beneficial results are obtained in irons with silicon 1.50 per cent or less where graphitization is promoted and chill decreased. When silicon is 2 per cent no effect is observed on those properties while, with 2.50 per cent silicon and above, chill is increased slightly as graphitization is retarded.

Additions of copper-manganese increase hardness, tensile strength and compressive strength markedly and improve the transverse properties slightly in low-alloy compositions. Improvements apply in high and low silicon irons poured in green and dry sand. Discussion of the paper was opened by J. W. Owings, Link-Belt Co., Philadelphia, who stated that in a small pump casting with a 2-inch section considerable trouble had been encountered until 1½ per cent copper and 0.50 per cent chromium was added to the iron. As a result trouble was eliminated and the castings showed no leakage under 8000 pounds per square inch water test, and were machined and tapped without difficulty.

Machinability Not Proved

A. E. Hageboeck, Frank Foundries Corp., Moline, Ill., inquired for data on machinability of copper-bearing cast iron; Mr. Eastwood replied that limited tests indicated good machinability in low-silicon irons, but further tests on a production basis would have to be made to make a definite determination of that point.

Harry Rayner, Dodge division, Chrysler Corp., Detroit, asked about the economic features and it was said that copper and manganese being cheaper than certain other alloys, the assumption was that the cost would be lower, but all factors would have to be considered to ascertain the most advantageous alloy.

J. S. Vanick, International Nickel Co., New York, pointed out that copper ingot could not be added in the cupola as it melts too fast, and that according to the data presented when the silicon is over 2 per cent copper additions increase the chill, and the same occurs when copper additions over 3 per cent are made.

Foreign exchange papers from British and French foundry associations were presented, the French exchange paper, "Heat Treated Cast Iron," prepared by M. Ballay and R. Chavy, Paris; and the British paper, "Heat Treatment by Hardening and Tempering," written by J. E. Hurst, president, Institute of British Foundrymen. The French paper was presented by R. F. Harrington, Hunt-Spiller Mfg. Co., Boston G. P. Phillips, International Harvester Co., Chicago, presented the British paper.

Foreign Papers Read

According to the authors of the French exchange paper, applications of heat treated gray irons are divided into four classes: Irons machinable as cast, then hardened; martensitic irons, either employed as cast or given a draw; martensitic irons, drawn, then hardened by quenching; and austenitic irons, drawn, then hardened. The paper explained several French applications of commercial importance.

Author of the British paper pointed out that one of the important developments in cast iron metallurgy is the hardening and tempering of that material. Although the effect of hardening was known as early as 1839, the effect of tempering in improving the properties is a modern development and is a result of research and investigation.

The paper discussed the effect of hardening and tempering on the mechanical properties, the effect of casting conditions and composition on properties obtainable; the effect of hardening and tempering on the stress-strain diagram and on the modulus of elasticity.

The second section of the paper was devoted to a discussion of the mechanism of hardening and tempering, effect of carbon, carbon plus silicon, and quenching temperatures. The third section dealt with the influence of chemical composition and alloy additions, their effect on the depth of hardening, stabilizing effect of molybdenum on the strength of nitrogen-hardening cast iron and effect on quenching speed. The final section explained the effect of hardening and tempering on internal stresses.

Use of alloys and their effect on cast iron were discussed at a cast iron shop course. G. P. Phillips, International Harvester Co., Chicago, cited reasons for using alloys in a typical gray iron foundry. These are as follows: To modify base iron and produce a greater variety of castings; and to obtain specific properties in castings, such as heat resistance and greater strength.

The common alloys were then listed by the speaker as nickel, chromium, molybdenum, manganese, copper, titanium and vanadium. Characteristics, effects, uses and general applications of these alloys were given.

Some of the basic fundamentals for the successful welding of cast iron were discussed at another shop course meeting. Fred J. Walls, International Nickel Co., New York, stressed the importance of proper schooling of welders. The co-ordination of knowledge between the welder and the foundryman also was emphasized. Mr. Walls stated the basic reasons for welding and cited expansion and contraction as the primary problem of this operation.

Mr. Walls pointed out the necessity for bringing a casting through the critical range of temperature slowly, to eliminate one cause of cracking. He told of some of the progress made in recent years in the development of equipment for welding.

DISCUSSION ON STEEL CASTING

PAUL DOUGHER, American Steel Foundries, East Chicago, Ind., presented a paper dealing with methods and equipment employed in the cleaning room with a view of reducing the cost of operation and improving the appearance of the castings. Extensive studies were made to determine the best method of handling the castings, the weight and length of the chisels, the character, composition and speed of the grinding wheels. By a change of pulleys the peripheral speed of the wheels is held to approximately 8500 feet per minute, while the wheel is wearing down. Efficacy of the wheel and in some instances the compensation of the workman is calculated from the weight of metal removed per hour.

Discussion on the subject of scal-

ing of steel castings in the annealing or heat treating furnaces developed the comment that many foundrymen apparently did not realize the extent of losses in this respect. On certain castings where the exposed surface was relatively small in comparison with the total mass, the loss by scaling might not exceed 2 per cent. On light castings where these conditions are reversed the loss might reach 8 per cent.

As an interesting sidelight on the discussion it was stated that for certain purposes low-carbon steel castings function just as satisfactorily in an unannealed as in the annealed condition, therefore in these instance annealing or normalizing is not necessary and simply constitutes an additional and unnecessary expense. However, the subject is debatable and a full knowledge of all phases should be taken into consideration by competent authority before advocating the use of unannealed steel castings. The general consensus of opinion seemed to be that the foregoing reference applied only to castings in which the carbon content is 0.20 per cent or lower.

Contraction Discussed

"Free and Hindered Contraction of Alloy Steel Castings" was the title of a paper prepared by C. W. Briggs and R. A. Gezelius, Naval Research Laboratory, Washington, and presented by Mr. Briggs. The discussion was the fourth in a series presented successively at preceding conventions of the American Foundrymen's association. It represented results of continued studies on problems incident to steel castings during the shrinkage and contraction period.

Results of an elaborate series of tests indicate that the free contraction of plain 0.35 per cent carbon steel is greater than that of any of the alloy steels in the series. Total percentage of free contraction varies from 2.27 per cent in the nickel-chromium steel to 2.40 per cent in nickel steel. The amount of contraction in both freely contracting and hindered contracting bars, prior to reaching the critical range, in general is dependent upon the temperature range. Total amount of hindered contraction obtained corresponds closely to that exhibited by plain carbon steel. Relative final positions of the different alloys vary somewhat with different tensions on the bars. Amount of expansion shown by the alloys during the critical range varied considerably. In general the amount of expansion under hindered contraction is greater than that recorded on freely contracting bars. Differences in the pouring temperature have no effect upon the total amount of contraction.

Reporting for the committee on methods of manufacture of liquid steel for castings. F. A. Melmoth, Detroit Steel Casting Co., Detroit, commented on the use of a rotary type furnace in England. The furnace is fired with powdered anthracite coal and the resulting steel meets all the chemical and physical specifications of steel melted in any other manner.

SAFETY AND HYGIENE

A SESSION devoted to the progress of medical, legislative and engineering aspects of safety and hygiene in the foundry attracted considerable interest. James R. Allan, chairman of the A. F. A. industrial hygiene codes committee, reported on the progress being made in the development of codes for various operations. He stated that there is already under development a code on grinding, polishing and buffing equipment sanitation, another on airflow measurement, and a testing code for exhaust systems. A code on the design of exhaust systems is well under way and one on foundry parting materials is being prepared.

Dr. R. R. Jacobs, past assistant surgeon, public health service, Washington, discussed the medical aspects of safety and hygiene in the foundry. He presented a review of what has been accomplished, stating that such a review should assist in providing greater interest, overcoming mass hysteria arising from misinformation, and indicate where conditions in the industry can be improved.

According to Dr. Jones, the following five factors are definitely related to industrial diseases: (1) Building; (2) housekeeping; (3) subjection to extreme temperatures, humidity, etc.; (4) inhalation of toxic gases and fumes; and (5) medical supervision.

Modern Equipment Bans Silicosis

Dr. Jones was emphatic in stating that the foundry using modern equipment and practicing good housekeeping has the problem of silicosis whipped. This speaks well for progress in the foundry industry, since all of the work has been accomplished in a period of less than 10 years. The medical angle is the crux of the entire problem. The physician should have the right to examine men, not for rejections, but for placement in the particular tasks for which they are qualified physically. The industrial physician should practice preventive medicine.

Voyta Wrabetz, chairman, industrial commission of Wisconsin, spoke on the legislative aspects of safety and hygiene. He stated that while 70 per cent of all accidents are caused by the human element, either through the employe injured or a co-employe, that occupational diseases result from conditions resting entirely upon industry. In Wisconsin, both employers and employes agree fully upon the responsibility for loss in time through occupational diseases as well as through accidents.

Problem of determining disability is difficult. In this, certain fundamentals must be present in legislation. Compensation should be provided only when the person is deprived of employment. Liability should rest with the last day of the last employer causing disability. Insurance carriers must cover the liability, as any employer who is in good faith is entitled to coverage. The merit rating should be made especially applicable to silicosis. Adequate medical examination should be encouraged but oppressive medical examination should be discouraged. Reasonable safety standards should be established by code.

NOMINATING COMMITTEE

THE following nominating committee was chosen for the selection of nominees for officers and directors, to be presented at the 1937 A. F. A. convention: R. Scheidewind, University of Michigan, Ann Arbor, Mich.; J. H. Locke, General Steel Castings Corp., Eddystone, Pa.; G. P. Phillips, International Harvester Co., Chicago; and H. J. Roast, Roast Laboratories, Montreal, Que.; alternates, Frank M. Robbins, Ross-Meehan Foundries Inc., Chattanooga, Tenn.; P. E. McKinney, Bethlehem Steel Co., Bethlehem, Pa.; W. H. Rother, Buffalo Foundry & Machine Co., Buffalo; and R. L. Binney, Binney Castings Co., Toledo, O. According to by-laws the last three past presidents also will serve on the nominating committee.

A. S. T. M. Program

(*Concluded from Page 57*)

Report of committee E-4 on metallography.

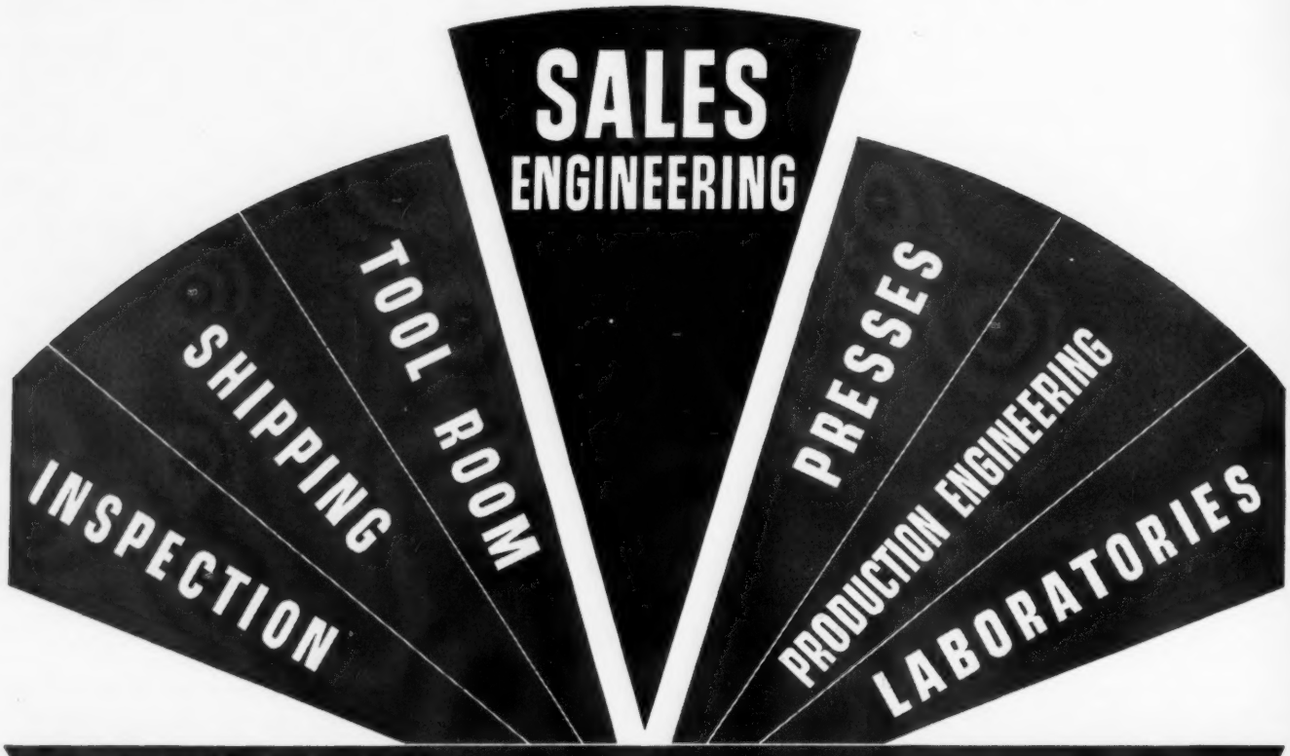
AFTERNOON

Nonferrous Metals (continued)

Report of committee B-7 on light metals and alloys, cast and wrought.
Report of committee B-6 on die-cast metals and alloys.
Report of committee B-2 on nonferrous metals and alloys.
"Effect of the Addition of Lead on the Endurance Limit of a Certain Tin-Base Bearing Alloy," by J. N. Kenyon, Columbia university.
"Ductility Testing of Aluminum and Aluminum Alloy Sheet," by R. L. Templin, Aluminum Co. of America.
"Effect of Iron Impurities on the Annealing of High Brass," by W. A. Gibson and J. H. Doss, Revere Copper & Brass Inc.
"Forming Properties of Some Nonferrous Sheet Metals," by G. R. Gohn, Bell Telephone Laboratories Inc.
"Stress-Relief Annealing High-Strength Monel Metal Plate," by P. R. Kosting, Watertown arsenal.

Ceramics, Paint

Report of committee C-3 on brick.
Report of committee C-8 on refractories.
"Methods of Measuring and Determining Gloss," by R. S. Hunter, national bureau of standards.
"Testing of Organic Finishes," by A. E. Schuh, Bell Telephone Laboratories Inc.



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Digging for facts that point the way to increased profits for American manufacturers . . . THAT is the *spearhead* of the following objectives of Truscon's Sales Engineering Service:

1. To IMPROVE DESIGN of your products as a practical means of increasing their sales appeal, securing greatest possible strength without an ounce of surplus weight and maintaining uniformity of identical parts.

2. To REDUCE WEIGHT of parts without sacrificing strength thereby securing appreciable savings in material costs and substantial reductions in shipping charges.

3. To ELIMINATE MACHINING through the correct application of the pressed steel process as a positive means of reducing fabricating costs.

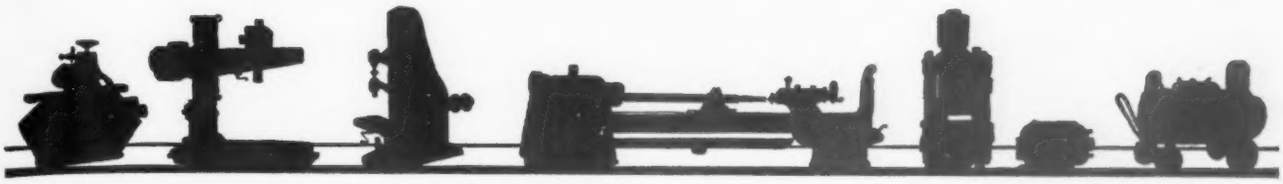
4. To SPEED UP PRODUCTION SCHEDULES through the faster method of securing your pressed steel parts from an organization qualified and equipped to function on every phase of pressed steel work . . . from inception of design to shipment of finished products.

Find out how YOUR specific needs can be concentrated in a single organization capable of shouldering every responsibility. Communicate with:

TRUSCON STEEL COMPANY • PRESSED STEEL DIVISION

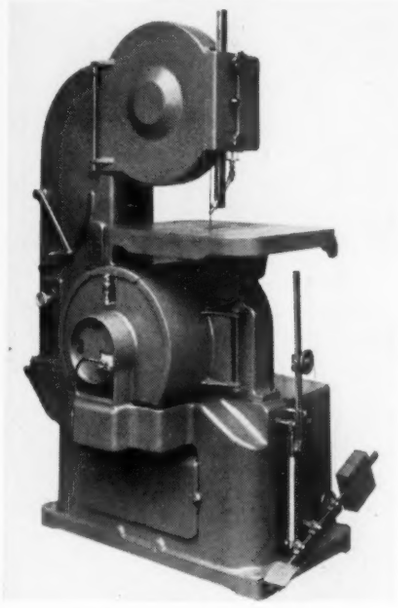
6100 TRUSCON AVENUE . . . CLEVELAND, OHIO

New Equipment



Open-End Bandsaw—

Grob Bros., West Allis, Wis., are placing on the market a new open-end model bandsaw. For use in internal sawing on dies and similar pieces, the saw shown here has a 19-inch throat and a saw band 140 feet long, helically wound on a cylindical aluminum drum. Pulleys are of 20-inch diameter, permitting the use of



Grob open-end bandsaw

blades ranging in thickness from 0.025 to 0.050-inch. Thicker blades allow cutting of sharper curves and more speed. A four-speed ¾-horsepower motor provides four cutting speeds, which may be changed while the saw is in operation, and another ¾-horsepower motor provides the reverse speed of 500 feet per minute.

• • •

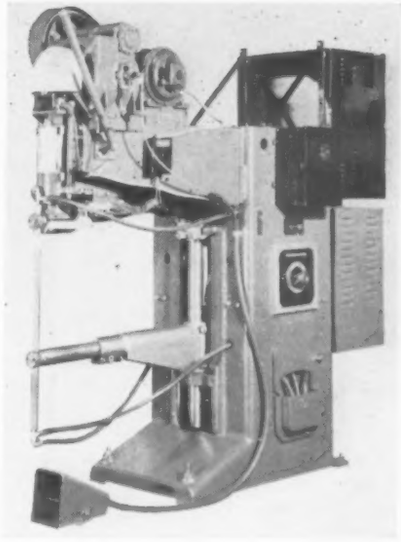
Press Welder—

Thomson-Gibb Electric Welding Co., 261 Pleasant street, Lynn, Mass., has recently developed a special press welder for use in shipbuilding work. It is designed to weld two thicknesses of 3/16-inch corrosion-resisting steel at a rate of from 30 to 40 spots per minute. An important feature of this machine is the special split-type head equipped with a hand lever so that the upper electrode can be located accurately on the work before the mechanically operated pressure device acts. This feature makes possible spot welds on lighter material by manual operation of the upper head. A pushbutton is mounted at the end of the hand lever so that the pressure and current can be controlled by the same hand. The arm is adjustable through a range of 24 inches. Other features of the machine, shown herewith, are: A 150-kilovolt-ampere capacity transformer, an auto-transformer and two seven-point voltage regulator switches, and an automatically adjustable timing device.

• • •

Thread Grinder—

Ex-Cell-O Aircraft & Tool Corp., Detroit, announces a new Universal precision thread grinder. The capacity of the machine pictured here is an external thread of 8-inch diameter and 24-inch length. Distance between centers is 33 inches. The machine is also adapted for grinding internal threads on work not smaller than 1 inch in diame er or length, and up to 8-inch diameters and 3-inch lengths. U. S. Standard, sharp V, 29-degree Acme and up to 60-degree thread forms and modified Buttress threads with single, double, triple, quadruple, or sextuple threads within the range of pitches



Thomson-Gibb press welder

from one to 40 can be ground. Tapers up to 2 inches per foot included angle can also be ground. Lead tolerance of 0.0002-inch per inch when grinding U. S. Standard threads may be maintained. The machine is automatic in all its grinding operations.

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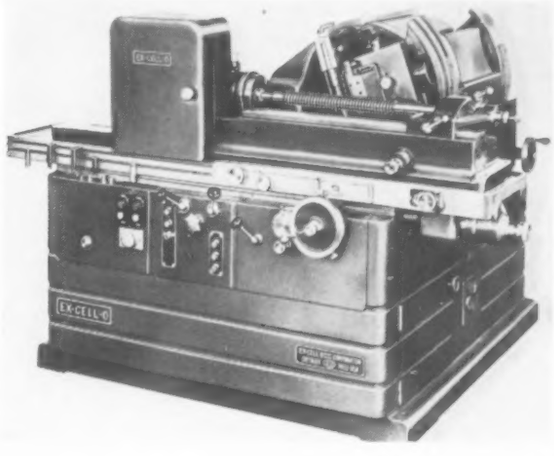
Column Press—

Oilgear Co., 1301-1417 West Bruce street, Milwaukee, announces a new 35-ton two column press. It



Ex-Cell-O universal precision thread grinder

Oilgear column press

is of welded construction, the base, sides, rear and yoke being welded together. The side pieces are of rectangular construction internally reinforced with ribbing and these together with the heavy back piece rigidly connect the opposing base and yoke without the aid of bolts or tie rods. Speeds of both pressing and return can be predetermined or varied by the operator through the semiautomatic control mechanism. The cylinder is a 9½-inch bore, double-acting bottle type, with a brass bushing to guide the ram. A 30-horsepower motor runs the two-way pump supplying the fluid power. The particular model illustrated is intended for use in a push broaching operation in the production of rear axle housing tubes.

♦ ♦ ♦

Roll-Over Device—

Matthews Conveyer Co., Ellwood City, Pa., has recently developed a roll-over device for turning winding machine frames 180 degrees. Devices of this nature are in general use for turning heavy objects during machining processes, thus speeding up operations in assembly and production lines. The unit in the accompanying illustration is 10 feet long and is designed to handle loads up to 1800 pounds. The roll-over operates on ball bearings and the loads are conveyed in like manner. The travel is controlled by electrical limit switches, and it requires 10 seconds to complete the revolution of 180 degrees.

♦ ♦ ♦

Bench Grinder—

Independent Pneumatic Tool Co., 600 West Jackson boulevard, Chicago, announces a new Thor 6-inch bench grinder to sell in the low price field. This new addition is particularly fitted for general grinding, polishing, buffing and wire brush work in factories, garages and similar jobs where a light-duty grinder can be economically used. The machine is of ball bearing construction throughout, with a completely enclosed motor. Adjustable tool rests and substantial wheel guards are featured. The unit is available for use with either alternating or direct current. Free speed of the motor is 3550 revolutions per minute. Weight of the grinder is 35¼ pounds.

♦ ♦ ♦

Deformation Tester—

Harry W. Dietert Co., 676 West Grand boulevard, Detroit, is placing on the market a deformation tester for use with the foundry sand strength machines built by the company. It consists of an aluminum arm pivoted on ground and sealed ball bearings at the fulcrum point of the pusher arm and weight of the strength machine. A special dial indicator is mounted on the free end of the deformation arm. This device makes it possible to measure the amount that the sand specimen decreases in weight or deforms at the instant it breaks. The deformation test is made at the same time as the compression test and is taken from a maximum reading hand on the dial indicator.

♦ ♦ ♦

Spray Cleaning Equipment—

Homestead Valve Mfg. Co., Coraopolis, Pa., has entered the low-priced cleaning equipment field with a new unit. The company has for years produced cleaning equipment under the trade name of Hypressure Jenny, and the new apparatus will carry the same name. It is to operate on the same principle as the larger models, accomplishing the cleaning by means of a stream of water vapor, hot water, and cleaning chemicals under a pressure of from 50 to 150 pounds per square inch. The unit shown here, known as model G, is self-contained, carrying water, solution and oil tanks; oil burner, vapor generator, water and solution pump; electric motor and vapor hose with a variety of nozzles. Pressure is developed by a spiral parallel coil-type generator and is controlled by an automatic pressure switch. The vaporizer burns kerosene or light furnace oil and temperature is thermostatically controlled.

Homestead Hypressure Jenny

♦ ♦ ♦

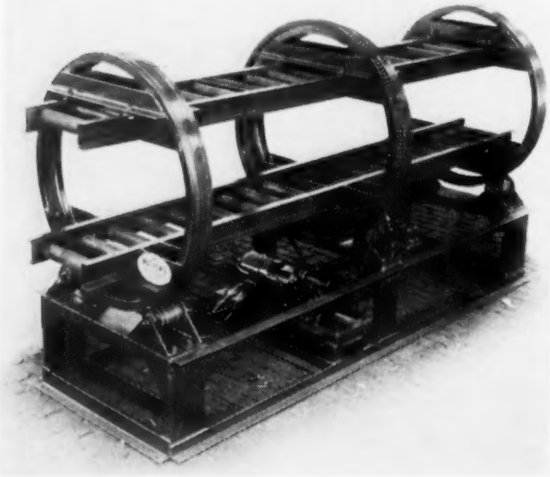
Multiple Circuit Plugs—

The Pyle-National Co., 1334 North Kostner Ave., Chicago, has announced a new series of 20-ampere plugs and receptacles designed for multiple circuits of from four to 16 poles. They are adapted to remote control circuits, thermo-coupled connections and similar purposes in connection with portable equipment. Receptacles and plugs are of cast-metal construction and are fully insulated in bakelite. Contacts are self-aligning to insure perfect contact. The units are rated 20 amperes, 250 volts direct current or 460 volts alternating current.

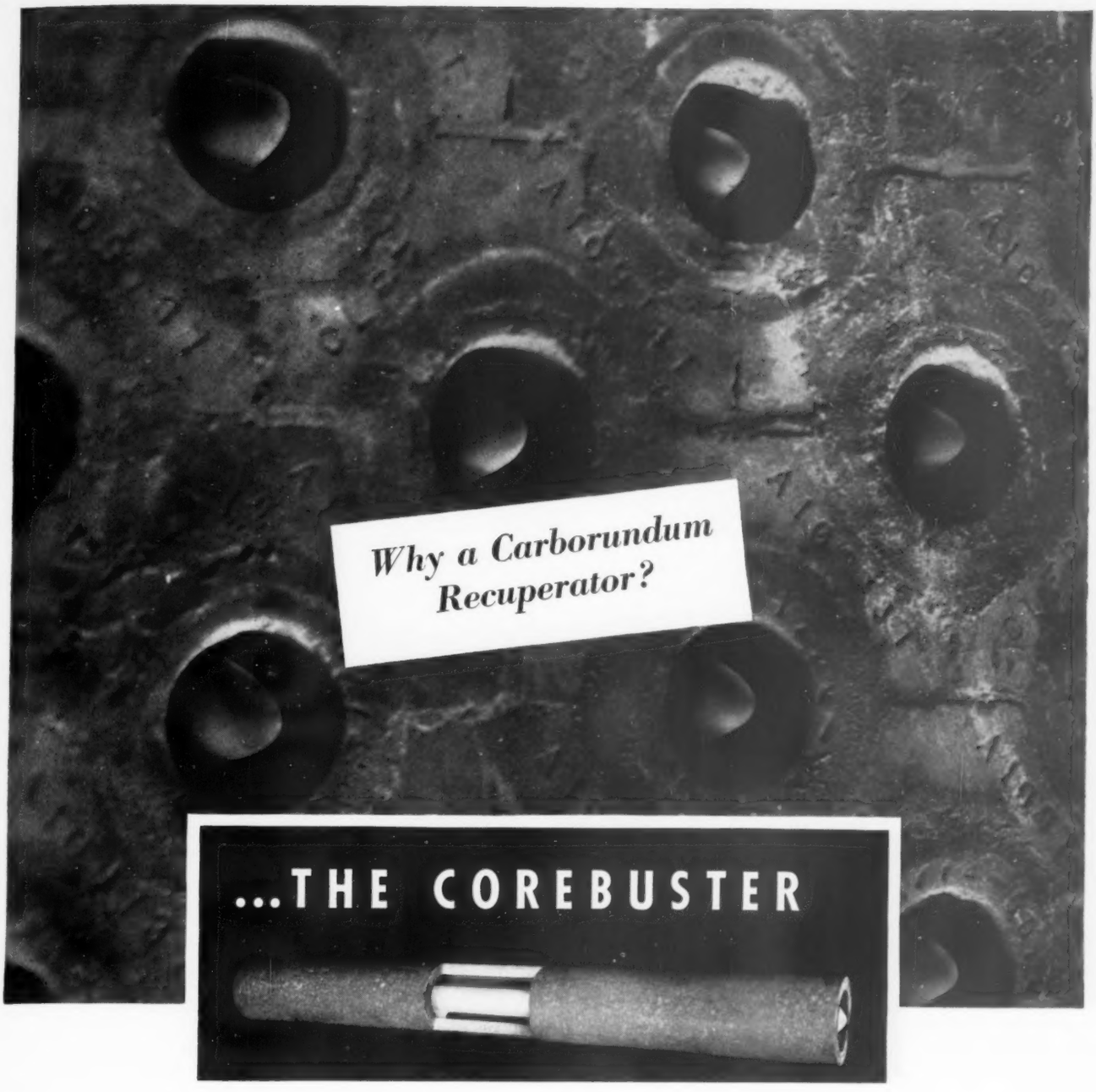
♦ ♦ ♦

Industrial Tires—

Musselman Products Co., 6271 St. Clair avenue, Cleveland, has developed a low-pressure tire for use on



Mathews Conveyer roll-over device



The corebuster is a patented feature of the Carborundum Recuperator. It consists of a fireclay rod centered in the "Carbofrax" tube as shown above. Three major advantages of this construction are:

1—The corebuster is heated by radiation from the tube wall to a temperature only slightly lower than that of the wall. Thus the useful convection area of the tube is increased by approximately 50%.

2—The corebuster promotes high velocity and turbulence, eliminating stratification of the air stream and breaking up the dead air film on the tube walls that is the main resistance to the passage of the heat.

3—The corebuster raises the rate of heat transfer of each "Carbofrax" tube, thus reducing the amount of heating surface required for any specified mean temperature difference.

THE CARBORUNDUM COMPANY RECUPERATOR
Equipped with "Carbofrax" Tubes

THE CARBORUNDUM COMPANY

Refractory Division, Perth Amboy, N. J.

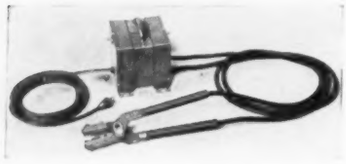
District Sales Branches: Boston, Chicago, Cleveland, Detroit, Philadelphia, Pittsburgh. Agents: L. F. McConnell, Birmingham, Ala.; Christy Firebrick Company, St. Louis; Harrison & Company, Salt Lake City, Utah; Pacific Abrasive Supply Co., Los Angeles, San Francisco, Seattle; Denver Fireclay Co., El Paso, Texas. (Carborundum and Carbofrax are registered trade-marks of The Carborundum Company.)

industrial trucks and similar vehicles. It is known as the Doenut Tire and operates under 12 to 15 pounds pressure. It is claimed that this tire reduces the effort necessary to move loads which are too light for power trucks and yet inconvenient for handling by hand trucks. It is adapted for use on portable grease guns, air compressors and the like as well as hand and platform trucks. It is designed for use with loads under 800 pounds. The wheel is disk type, fully cadmium plated and ball bearing equipped.

• • •

Heated-Jaw Pliers—

Ideal Commutator Dresser Co., 1934 Park avenue., Sycamore, Ill., has added to the line of electric tools it produces a new unit to be known as the Thermo-Grip pliers. Used to replace a blow-torch or soldering iron, the jaws of these



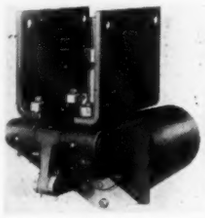
Thermo-Grip pliers

pliers rapidly heat to a white-hot temperature when they are connected to any alternating-current outlet. Among the applications of this tool are installation, changes, or repairs to wiring, piping, or the installation of copper tubing. The pliers as shown in the illustration have renewable carbon jaws and insulated fiber handles. They are supplied with a high-low heat control and an on-off switch. Current is consumed only when the pliers are being used. The entire unit consisting of pliers, transformer and cord, weighs 14 pounds.

• • •

Clutch Operator—

Cleveland Punch & Shear Works Co., Cleveland, has recently developed a new air operator for friction



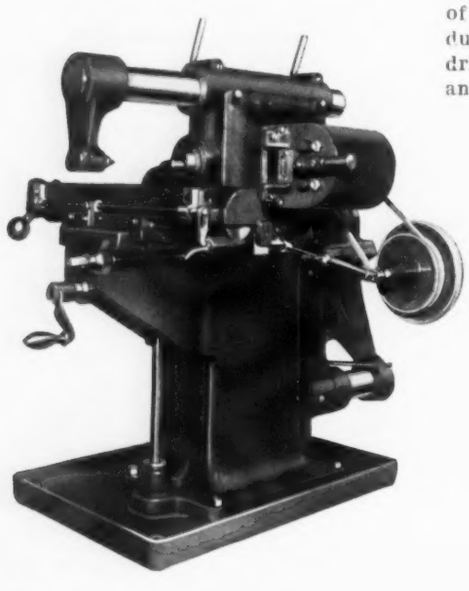
Cleveland Punch & Shear air operator for friction clutch

clutches and brakes. This air operator was designed and developed to speed up production, reduce wear and eliminate unnecessary man power. Each man working on a machine can be provided with control buttons either hand or foot operated and the controls are so arranged that only when all the buttons are depressed will the clutch be thrown into engagement. The electrical part of this equipment is usually furnished with a four position selector for momentary, long, inching and continuous operation. This air operator is decidedly more sensitive than a manually operated friction clutch, having possibilities almost equivalent to an air clutch by reason of the fact that it engages and disengages very rapidly.

• • •

Milling Machine Drive—

Burke Machine Tool Co., Conneaut, O., has developed a new motor drive for its milling machines, involving use of a V-type belt to the spindle as shown in the illustration. This has increased the efficiency of the machine and the low mounting of the motor made possible has reduced vibration to a minimum. New drives are applicable to both hand and power fed machines, numbers 1, 2, 3, and 4. All attachments manufactured by the company can be used in connection with these machines. Standard machines are furnished with extra heavy bronze bearings, although antifriction bearings are available for high-speed work.



Burke milling machine drive using V-belt

New Trade Publications

Electric Furnaces—Duncan Mackenzie's Sons Co. Inc., Trenton, N. J. A bulletin on its Thermograd electric furnaces, model B-2-2750, working temperature to 2750 degrees Fahr.

Materials Handling—Lewis-Shepard Co., Watertown, Mass. Circular No. 199, a quick lesson in materials handling, describing stackers and portable elevators, hand and power hoist.

Gears—Ohio Gear Co., 1333 East 179th street, Cleveland. A catalog of its line of spur, bevel, worm gears, motorized speed reducers; technical data of use to gear users are included.

Stainless Steel—Rustless Iron & Steel Corp., Baltimore. A bulletin on its corrosion and heat resisting stainless steels, classified according to the several recommended uses.

Bench Miller—Pratt & Whitney Co., Hartford, Conn. Circular No. 422 on its No. 3 universal bench miller, illustrated with applications to various kinds of work.

Control Instruments—Brown Instrument Co., Philadelphia. A booklet on the value and economy of controls and recording instruments in industry from the viewpoint of the executive.

Welding—Torchweld Equipment Co., 1035 West Lake street, Chicago. A catalog section on its piece parts for welding and cutting torches, tips and gas pressure regulators.

Foundry Ladles—Whiting Corp., Harvey, Ill. Catalog No. 216 on its line of ladles for foundry use; fully illustrated to show types and variety of uses as well as construction features.

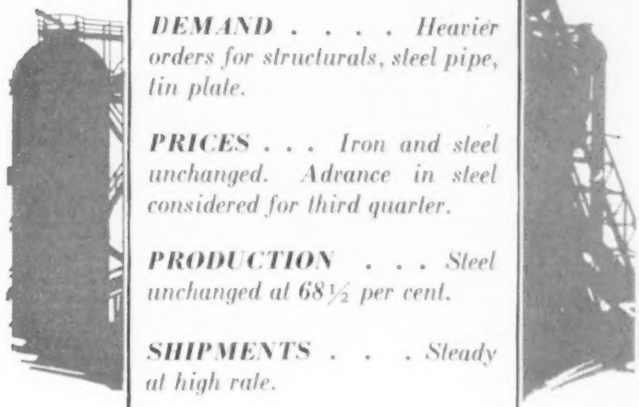
Chain—Columbus-McKinnon Chain Corp., Tonawanda, N. Y. Catalog No. 7 on welded and weldless chain, including data in quick reference form; how to buy chain for greatest wear, precautions to prevent undue strain, types for various jobs.

Rust Preventive—Flood Co., 6217 Carnegie avenue, Cleveland. A booklet on Penetrol, a compound painted on a rusted surface making it a protective coating as a base for subsequent finishes, its effect being to prevent further rusting of the steel or iron.

Portable Cable—General Electric Co., Schenectady, N. Y. Bulletin GEA-1918A on portable cable, giving data and listings of all types, for mining, welding and transit equipment, electric shovels, dredges and similar equipment; additions since previous issue include new loom-sheath and glyptal types, shielded cable for high-voltage service.

Heavy Products Feature Gains in Steel Orders

Demand Well Balanced; Operating Rate Steady; Price Advance Undecided



MARKET IN TABLOID

DEMAND . . . . *Heavier orders for structurals, steel pipe, tin plate.*

PRICES . . . *Iron and steel unchanged. Advance in steel considered for third quarter.*

PRODUCTION . . . *Steel unchanged at 68½ per cent.*

SHIPMENTS . . . *Steady at high rate.*

HEAVIER commitments for structural shapes, steel pipe, sheets and tin plate; an increase in pig iron shipments, and prospects for a high rate of production this summer in many steel consuming industries, including agricultural equipment and railroad car building, impart additional buoyancy to the markets.

While the preponderance of opinion in the industry at present is that there will be no general advance in steel prices for third quarter, some producers consider it more than a remote possibility. Steelmakers in the past few years have publicized contemplated rises more often than they have actually declared them.

In 1934 when prices were raised for third quarter, after consumers had been given an opportunity to cover requirements, steelworks operations dropped from a peak of 62 per cent in June to an average of 24 per cent in the next three months. Downward revisions were made in July. This year evidently automotive requirements will be at the year's low in the third quarter. A beginning may be made, however, for an effective increase for fourth quarter.

The automotive industry continues to set the pace in steel requirements, automobile production last week at 117,156 units showing only a slight reduction. Steelworks operations held at 68½ per cent.

Texas Empire Pipe Line Co., New York, an affiliate of Cities Service and the Texas Co., awarded 41,000 tons of steel pipe for a line between Kansas City and Chicago, to Republic Steel Corp., and A. O. Smith Mfg. Corp.

Missouri Pacific is reported to have placed 2000 freight cars. As a result of recent awards, car shops will be busy through July and August, when usually they are shut down.

Topped by 15,000 tons for Chicago's outer drive bridges, and 5300 tons for a Philadelphia vocational school, structural shape awards at 40,039 tons were more than double recent weekly average, and highest this year. Reinforcing steel bar awards increased to 15,314 tons.

Farm equipment manufacturers anticipate a continuation of heavy operations for 30 to 60 days. They are now starting fall production programs, and believe new business will be sufficient to maintain good, if not capacity, schedules during the summer. Many manufacturing lines are more active in ordering steel, including the textile machinery industry.

In the lighter steel products, formal award of 65,000 tons of sheets for Chevrolet car frames, booked by the E. G. Budd Mfg. Co., Philadelphia, is expected shortly. Sheet mills are operating at 65 to 70 per cent. Tin plate production is up 5 points to 95 per cent.

Foundry operations are holding at the year's peak, and from pig iron orders now on sellers' books for delivery this quarter it appears there will have to be a steady upturn through June. Extensive blast furnace rehabilitation work at Pittsburgh is an active factor in the equipment market there. Freight rates from Birmingham, Ala., to five southern states have been reduced 33 per cent, to enable pig iron to compete with scrap, and shipments are expected to increase considerably this year.

Scrap still is weak, and prices are off another 50 cents a ton. Mills are waiting while middle interests drive down the market in covering their higher price orders.

Steelworks operations in the Pittsburgh district last week advanced 1 point to 63 per cent; Buffalo 2 to 75. Wheeling was down 3 to 89; New England 1 to 77; Cincinnati 4 to 80, while others were unchanged.

STEEL's iron and steel price composite is off 4 cents to $32.94; the finished steel index remains $52.20, while the scrap composite is down 16 cents to $13.38.

COMPOSITE MARKET AVERAGES

	May 16	May 9	May 2	One Month Ago April, 1936	Three Months Ago Feb., 1936	One Year Ago May, 1935	Five Years Ago May, 1931
Iron and Steel	$32.94	$32.96	$33.00	$33.10	$33.48	$32.35	$31.07
Finished Steel	52.20	52.20	52.20	52.20	53.70	54.00	49.02
Steelworks Scrap	13.38	13.54	13.92	14.39	13.83	10.27	9.31

Iron and Steel Composite:—Pig iron, scrap, billets, sheet bars, wire rods, tin plate, wire, sheets, plates, shapes, bars, black pipe, rails, alloy steel hot strip, and cast iron pipe at representative centers. Finished Steel Composite:—Plates, shapes, bars, hot strip, nails, tin plate, pipe. Steelworks Scrap Composite:—Heavy melting steel and compressed sheets.

A COMPARISON OF PRICES

Representative Market Figures for Current Week; Average for Last Month, Three Months and One Year Ago

Finished Material

	May 16, 1936	April 1936	Feb. 1936	May 1935
Steel bars, Pittsburgh	1.85c	1.85c	1.85c	1.80c
Steel bars, Chicago	1.90	1.90	1.90	1.85
Steel bars, Philadelphia	2.16	2.11	2.16	2.11
Iron bars, Terre Haute, Ind.	1.75	1.75	1.75	1.75
Shapes, Pittsburgh	1.80	1.80	1.80	1.80
Shapes, Philadelphia	2.01½	2.01½	2.01½	2.01½
Shapes, Chicago	1.85	1.85	1.85	1.85
Tank plates, Pittsburgh	1.80	1.80	1.80	1.80
Tank plates, Philadelphia	2.00	1.99	1.99	1.99
Tank plates, Chicago	1.85	1.85	1.85	1.85
Sheets, No. 10, hot rolled, Pitts.	1.85	1.85	1.85	1.85
Sheets, No. 24, hot ann., Pitts.	2.40	2.40	2.40	2.40
Sheets, No. 24, galv., Pitts.	3.10	3.10	3.10	3.10
Sheets, No. 10, hot rolled, Gary	1.95	1.95	1.95	1.95
Sheets, No. 24, hot anneal., Gary	2.50	2.50	2.50	2.50
Sheets, No. 24, galvan., Gary	3.20	3.20	3.20	3.20
Plain wire, Pittsburgh	2.40	2.40	2.30	2.30
Tin plate, per base box, Pitts.	5.25	5.25	5.25	5.25
Wire nails, Pitts.	2.10	2.10	2.40	2.60

Semifinished Material

Sheet bars, open-hearth, Youngs.	$28.00	28.00	30.00	28.00
Sheet bars, open-hearth, Pitts.	28.00	28.00	30.00	28.00
Billets, open-hearth, Pittsburgh	28.00	28.00	29.00	27.00
Wire rods, Pittsburgh	40.00	40.00	40.00	38.00

Pig Iron

	May 16, 1936	April 1936	Feb. 1936	May 1935
Bessemer, del. Pittsburgh	$20.8132	20.8132	20.8132	19.80
Basic, Valley	19.00	19.00	19.00	18.00
Basic, eastern del. East. Pa.	20.8132	20.8132	20.8132	19.81
No. 2 fdy., del. Pittsburgh	20.3132	20.3132	20.3132	19.30
No. 2 fdy., Chicago	19.50	19.50	19.50	18.50
Southern No. 2, Birmingham	15.50	15.50	15.50	14.50
Southern No. 2, del. Cincinnati	20.2007	20.2007	20.2007	19.38
No. 2X eastern, del. Phila.	21.6882	21.6882	21.6882	20.68
Malleable, Valley	19.50	19.50	19.50	18.50
Malleable, Chicago	19.50	19.50	19.50	18.50
Lake Sup., charcoal, del. Chicago	25.2528	25.2528	25.2528	24.25
Ferromanganese, del. Pitts.	80.13	80.13	80.13	90.13
Gray forge, del. Pittsburgh	19.6741	19.6741	19.6741	18.66

Scrap

Heavy melting steel, Pittsburgh	$14.75	15.75	14.80	12.00
Heavy melt. steel, No. 2, east. Pa.	12.00	12.70	12.00	9.25
Heavy melting steel, Chicago	12.75	14.35	14.30	10.20
Rail for rolling, Chicago	14.50	15.75	15.50	11.05
Railroad steel specialties, Chicago	14.75	15.85	15.75	11.40

Coke

Connellsville, furnace, ovens	$3.50	3.50	3.50	3.60
Connellsville, foundry, ovens	4.25	4.25	4.20	4.60
Chicago, by-product foundry, del.	9.75	9.75	9.75	9.25

Steel, Iron, Raw Material, Fuel and Metals Prices

Except when otherwise designated, prices are base, f.o.b. cars. Asterisk denotes price change this week.

Sheet Steel

Prices Subject to Quantity Extras and Deductions (Except Galvanized)

Hot Rolled No. 10, 24-48 in.

Pittsburgh	1.85c
Gary	1.95c
Chicago, delivered	1.98c
Detroit, del.	2.05c
New York, del.	2.20c
Philadelphia, del.	2.16c
Birmingham	2.00c
St. Louis, del.	2.18c
Pacific ports, f.o.b. cars, dock	2.40c

Hot Rolled Annealed No. 24

Pittsburgh	2.40c
Gary	2.50c
Chicago, delivered	2.53c
Detroit, delivered	2.60c
New York, del.	2.75c
Philadelphia, del.	2.71c
Birmingham	2.55c
St. Louis, del.	2.72c
Pacific ports, f.o.b. cars, dock	3.05c

Galvanized No. 24

Pittsburgh	3.10c
Gary	3.20c
Chicago, delivered	3.23c
Philadelphia, del.	3.41c
New York, del.	3.45c
Birmingham	3.26c
St. Louis, del.	3.43c
Pacific ports, f.o.b. cars, dock	3.70c

Tin Mill Black No. 28

Pittsburgh	2.75c
Gary	2.85c
St. Louis, delivered	3.08c

Cold Rolled No. 10

Pittsburgh	2.50c
Gary	2.60c
Detroit, delivered	2.70c
Philadelphia, del.	2.81c
New York, del.	2.85c
Pacific ports, f.o.b. cars, dock	3.10c

Cold Rolled No. 20

Pittsburgh	2.95c
Gary	3.05c
Detroit, delivered	3.15c
Philadelphia, del.	3.26c
New York, del.	3.30c

Enameling Sheets

Pittsburgh, No. 10	2.35c
Pittsburgh, No. 20	2.95c
Gary, No. 10	2.45c
Gary, No. 20	3.05c

Tin and Terne Plate

Gary base, 10 cents higher.

Tin plate, coke base (box) Pittsburgh	$5.25
Do., waste-waste	2.75c
Do., strips	2.50c
Long ternes, No. 24 unassorted, Pitts.	3.40c
Do., Gary	3.50c

Corrosion and Heat-Resistant Alloys

Pittsburgh base, cents per lb.

Chrome-Nickel

	No. 302	No. 304
Bars	23.00	24.00
Plates	26.00	28.00
Sheets	33.00	35.00
Hot strip	20.75	22.75
Cold strip	27.00	29.00

Straight Chromes

	No. 410	No. 430	No. 442	No. 446
Bars	17.00	18.50	21.00	26.00
Plates	20.00	21.50	24.00	29.00
Sheets	25.00	28.00	31.00	35.00
Hot strip	15.75	16.75	21.75	26.75
Cold stp	20.50	22.00	27.00	35.00

Steel Plates

Pittsburgh	1.80c
New York, del.	2.09c
Philadelphia, del.	1.99c
Boston, delivered	2.22c
Buffalo, delivered	2.05c
Chicago or Gary	1.85c
Cleveland, del.	1.99½c
Birmingham	1.95c
Coatesville, base	1.90c
Sparrows Pt., base	1.90c
Pacific ports, f.o.b. cars, dock	2.35c
St. Louis, delivered	2.08c

Structural Shapes

Pittsburgh	1.80c
Philadelphia, del.	2.01½c
New York, del.	2.06½
Boston, delivered	2.20½c
Bethlehem	1.90c
Chicago	1.85c
Cleveland, del.	2.00c
Buffalo	1.90c
Gulf Ports	2.20c
Birmingham	1.95c
Pacific ports, f.o.b. cars, dock	2.35c

Bars

Soft Steel

(Base, 3 to 25 tons)

Pittsburgh	1.85c
Chicago or Gary	1.90c
Duluth	2.00c
Birmingham	2.00c
Cleveland	1.90c
Buffalo	1.95c
Detroit, delivered	2.00c
Pacific ports, f.o.b. cars, dock	2.40c
Philadelphia, del.	2.16c
Boston, delivered	2.27c
New York, del.	2.20c
Pitts., forg. qual.	2.10c

Rail Steel

To Manufacturing Trade

Pittsburgh	1.70c
Chicago or Gary	1.75c
Moline, Ill.	1.75c
Cleveland	1.75c
Buffalo	1.80c

Iron

Troy, N. Y.	1.70c
Terre Haute, Ind.	1.75c
Chicago	1.80c
Philadelphia	2.06c
Pittsburgh, refined	2.75-7.50c

Reinforcing

New billet, straight lengths, quoted by distributors.

Pittsburgh	1.95c-2.05c
Chicago, Gary, Buffalo, Cleve., Birm., Young.	2.10c
Gulf ports	2.45c
Pacific coast ports f.o.b. car docks	2.45c
Philadelphia, del.	2.26c-2.36c

Rail steel, straight lengths, quoted by distributors

Pittsburgh	1.90c
Chicago, Buffalo, Cleveland, Birm., Young.	1.95c
Gulf ports	2.30c

Wire Products

(Base, 3 to 25 tons)

(Prices apply to straight or mixed carloads; less carloads $4 higher; less carloads fencing $5 over base column.)

Base Pitts.-Cleve. 100 lb. keg.	
Stand. wire nails	2.10c
Cement c't'd nails	2.10c
Galv. nails, 15 gage and finer	4.10c
do. finer than 15 ga.	4.60c

(Per pound)

Polished staples	2.80c
Galv. fence staples	3.05c
Barbed wire, galv.	2.60c
Annealed fence wire	2.65c
Galv. fence wire	3.00c
Woven wire fencing (base column, c.l.)	$58.00

To Manufacturing Trade

Plain wire, 6-9 ga.	2.40c

Anderson, Ind. (merchant products only) and Chicago up $1; Duluth up $2; Birmingham up $3.

Spring wire, Pitts. or Cleveland	3.05c

Do., Chicago up $1, Worc. $2.

Cold-Finished Carbon Bars and Shafting

Base, Pitts., one size, shape, grade, shipment at one time to one destination

10,000 to 19,999 lbs.	2.10c
20,000 to 59,999 lbs.	2.05c
60,000 to 99,999 lbs.	2.00c
100,000 lbs. and over	1.97½c

Gary, Ind., Cleve., Chi., up 5c Buffalo, up 10c; Detroit, up 20c; eastern Michigan, up 25c

Alloy Steel Bars (Hot)

(*Base, 3 to 25 tons.*)

Pittsburgh, Buffalo, Chicago, Massilon, Canton, Bethlehem 2.45c

S.A.E.	Alloy Diff.	S.A.E.	Alloy Diff.
2000	0.25	3100	0.55
2100	0.55	3200	1.35
2300	1.50	3300	3.80
2500	2.25	3400	3.20

4100 0.15 to 0.25 Mo.	0.50
4600 0.20 to 0.30 Mo. 1.25-1.75 Ni	1.05
5100 0.80-1.10 Cr	0.45
6100 Cr. spring	base
6100 bars	1.20
6100 spring	0.70
Cr., Ni., Van.	1.50
Carbon Van.	0.95
9200 spring flats	base
9200 spring rounds, squares	0.25

Piling

Pittsburgh	2.15c
Chicago, Buffalo	2.25c

Strip and Hoops

(Base, hot rolled, 25-1 ton)
(Base, cold-rolled, 25-3 tons)

Hot strip to 23/16-in. Pittsburgh	1.85c
Chicago or Gary	1.95c
Birmingham base	2.00c
Detroit, del.	2.05c
Philadelphia, del.	2.16c
New York, del.	2.20c
Cooperage hoop, Pittsburgh	1.95c
Chicago	2.05c
Cold strip, 0.25 carbon and under, Pitts., Cleveland	2.60c
Detroit, del.	2.81c
Worcester, Mass.	2.80c

Rails, Track Material

(Gross Tons)

Standard rails, mill	$36.37½
Relay rails, Pitts.	
20-45 lbs.	$28.00
45-50 lbs.	$25.00
50-60 lbs.	$26.00
70-75 lbs.	$25.50
80-90 lbs.	$26.00
100 lbs.	$27.00
Light rails, billet qual. Pitts., Chi.	$35.00
Do., reroll, qual.	34.00
Angle bars, billet, Gary, Ind., So. Chi.	2.55c
Do., axle steel	2.10c
Spikes, R. R. base	2.60c
Track bolts, base	3.60c
Tie plates, base	1.90c

Base, light rails 25 to 40 lbs.; 50 to 60 lbs. inclusive up $2; 16 and 20 lbs., up $1; 12 lbs. up $2; 8 and 10 lbs., up $5. Base railroad spikes 200 kegs or more; base tie plates 20 tons.

Bolts and Nuts

Pittsburgh, Cleveland, Birmingham, Chicago. Discounts to legitimate trade as per Dec. 1, 1932 lists:

Carriage and Machine

½ x 6 and smaller	70-10-5 off
Do. larger	70-10 off
Tire bolts	55 off

Plow Bolts

All sizes	70-10 off

Stove Bolts

In packages with nuts attached 72½-10-10 off; in packages with nuts separate 72½-10-10-5 off; in bulk 82½ off on 15,000 of 3-inch and shorter, or 5000 over 3-inch.

Step bolts	65-5 off
Elevator bolts	65-5 off

Nuts

S. A. E. semifinished hex.; ½ to 1⅛-inch	60-20-15 off
Do., ½ to 1-inch	60-20-15 off
Do., over 1-inch	60-20-15 off

Hexagon Cap Screws

Milled	80-10-10 off
Upset, 1-in., smaller	85 off

Square Head Set Screws

Upset, 1-in., smaller	75-10 off
Headless set screws	75 off

Rivets, Wrought Washers

Struc., c. l., Pittsburgh, Cleveland	2.90c
Struc., c. l., Chicago	3.00c
⅞-in. and smaller, Pitts., Chi., Cleve.	70 and 5 off
Wrought washers, Pitts., Chi., Phila. to jobbers & large nut, bolt mfrs.	$6.25 off

Cut Nails

Cut nails, Pitts.; (10% discount on size extras)	$2.75
Do. less carloads, 5 kegs or more, no discount on size extras	$3.95
Do., under 5 kegs; no disc. on size extras	$3.20

Pipe and Tubing

Base $200 net ton, except on standard commercial seamless boiler tubes under 2 inches and cold drawn seamless tubing.

Welded Iron, Steel Pipe

Base discounts on steel pipe, Pitts., Lorain, O., to consumers in carloads. Gary, Ind., 2 points less. Chicago, del. 2½ points less. Wrought pipe, Pittsburgh.

Butt Weld

Steel

In.	Blk.	Galv.
¼ and ⅜	60	44½
½	64½	55
¾	67½	59
1—3	69½	61½

Iron

½	31½	15
¾	36½	20½
1—1¼	39½	25½
2	41½	26

Lap Weld

Steel

2	62	53½
2½—3	65	56½
3½—6	67	58½
7 and 8	66	56½
9 and 10	65½	56

Iron

2	37	22½
2½—3½	38	25
4—8	40	28½

Line Pipe

Steel

⅛, butt weld		56
¼ and ⅜, butt weld		59
½, butt weld		63½
¾, butt weld		66½
1 to 3, butt weld		68½
2, lap weld		61
2½ to 3, lap weld		64
3½ to 6, lap weld		66
7 and 8, lap weld		65

Iron

⅛—1½ inch, black and galv. take 4 pts. over; 2½—6 inch 2 pts. over discounts for same sizes, standard pipe lists, 8—12-inch, no extra.

Boiler Tubes

C. L. Discounts, f.o.b. Pitts.

Lap Weld Steel		*Charcoal Iron*	
2—2¼	33	1¾	8
2½—2¾	40	2—2¼	13
3	47	2½—2¾	16
3¼—3½	50	3	17
4	52	3¼—3½	18
4½—5	42	4	20
		4½	21

In lots of a carload or more, above discounts subject to preferential of two 5% and one 7½% discount on steel and 10% on charcoal iron.

Lapwelded steel: 200 to 9999 pounds, ten points under base, one 5% and one 7½%. Under 2000 pounds 15 points under base, one 5% and one 7½%. Charcoal iron: 10,000 pounds to carloads, base less 5%; under 10,000 lbs., 2 points under base.

Seamless Boiler Tubes

Under date of May 15 in lots of 40,000 pounds or more for cold-drawn boiler tubes and in lots of 40,000 pounds or feet or more for hot-finished boiler tubes, revised prices are quoted for 55 cold-drawn boiler tube sizes ranging from ¼ to 6-inch outside diameter in 30 wall thicknesses, decimal equivalent from 0.035 to 1.000, on a dollars and cents basis per 100 feet and per pound. Less-carloads revised as of July 1, 1935, card.

Hot-finished carbon steel boiler tube prices also under date of May 15 range from 1 through 7 inches outside diameter, inclusive, and embrace 47 size classifications in 22 decimal wall thicknesses ranging from 0.109 to 1.000, prices also being on a lb. and 100 ft. basis.

Seamless Tubing

Cold drawn; f.o.b. mill disc.

100 ft. or 150 lbs.	32%
15,000 ft. or 22,500 lbs.	70%

Cast Iron Water Pipe

Class B Pipe—Per Net Ton

6-in. & over, Birm.	$39.00-40.00
4-in., Birmingham	42.00-43.00
4-in., Chicago	50.40-51.40
6 to 24-in. Chicago	47.40-48.40
6-in. & over, east. fdy.	43.00
Do., 4 in.	46.00

Class A pipe $3 over Class B
Stnd. fitgs., Birm. base $100.00

Semifinished Steel

Billets and Blooms

4 x 4-inch base; gross ton.

Pitts., Chi., Cleve., Buffalo & Youngstown	$28.00
Philadelphia	34.67
Duluth	30.00

Forging Billets

6 x 6 to 9 x 9-in., base

Pitts., Chi., Buff.	35.00
Forging, Duluth	37.00

Sheet Bars

Pitts., Cleve., Young., Chi., Buff., Canton, Sparrows Pt.	28.00

Slabs

Pitts., Chi., Cleve., Young.	28.00

Wire Rods

Pitts., Cleve., No. 4 to 5	$38.00
Do., No. 5 to 15/32-inch	40.00
Do., over 15/32 to 47/64-inch	42.00

Chicago up $1; Worcester up $2

Skelp

Pitts., Chi., Young., Buff., Coatesville, Sparrows Point	1.80c

Coke

Price Per Net Ton

Beehive Ovens

Connellsville, fur.	$3.50- 3.60
Connellsville, fdry.	4.25- 4.35
Connel. prem. fdry.	5.35- 5.50
New River fdry.	6.00
Wise county fdry.	4.45- 5.00
Wise county fur.	4.00- 4.50

By-Product Foundry

Newark, N. J., del.	9.70-10.15
Chi., ov., outside del.	9.00
Chicago, del.	9.75
New England, del.	11.50
St. Louis, del.	10.00-10.50
Birmingham, ovens	6.50
Indianapolis, del.	9.40
Cincinnati, del.	9.50
Cleveland, del.	9.75
Buffalo, ovens	7.50- 8.00
Detroit, ov., out. del	9.00
Philadelphia, del.	9.38

Coke By-Products

Per gallon, producers' plants.

	Tank lots	Spot
Pure and 90% benzol	18.00c	
Toluol	30 00c	
Solvent naphtha	30 00c	
Industrial xylol	30.00c	

Per lb. f.o.b. New York.

Phenol (200 lb. drums)	16.30c
Do. (100 lbs.)	17.30c

Eastern Plants, per lb.

Naphthalene flakes and balls, in bbls., to jobbers	7.25c

Per 100 lb. Atlantic seaboard

Sulphate of ammonia	$1.30

†Western prices, ½-cent up.

Pig Iron

Delivered prices include switching charges only as noted. No. 2 foundry is 1.75-2.25 sil.; 25c diff. for each 0.25 sil. above 2.25; 50c diff. for each 0.25 below 1.75. Gross tons.

Basing Points:	No. 2 Fdry	Malleable	Basic	Bessemer
Bethlehem, Pa.	$20.50	$21.00	$20.00	$21.50
Birdsboro, Pa.	20.50	21.00	20.00	21.50
Birmingham, Ala., southern del.	15.50	15.50	14.50	21.00
Buffalo	19.50	20.00	18.50	20.50
Chicago	19.50	19.50	19.00	20.00
Cleveland	19.50	19.50	19.00	20.00
Detroit	19.50	19.50	19.00	20.00
Duluth	20.00	20.00	.....	20.50
Erie, Pa.	19.50	20.00	19.00	20.50
Everett, Mass.	20.50	21.00	20.00	21.50
Hamilton, O.	19.50	19.50	19.00	.....
Jackson, O.	20.25	20.25	19.75	.....
Neville Island, Pa.	19.50	19.50	19.00	20.00
Provo, Utah	17.50	.....	17.00	.....
Sharpsville, Pa.	19.50	19.50	19.00	20.00
Sparrows Point, Md.	20.50	.....	20.00	.....
Swedeland, Pa.	20.50	21.00	20.00	21.50
Toledo, O.	19.50	19.50	19.00	20.00
Youngstown, O.	19.50	19.50	19.00	20.00
Delivered from Basing Points:				
Akron, O., from Cleveland	20.76	20.76	26.26	21.26
Baltimore from Birmingham	21.08	.....	19.96	.....
Boston from Birmingham	20.62	.....	20.50	.....
Boston from Everett, Mass.	21.00	21.50	20.50	22.00
Boston from Buffalo	21.00	21.50	20.50	22.00
Brooklyn, N. Y., from Bethlehem	22.93	23.43	.....	.....
Brooklyn, N. Y., from Bmghm.	22.50	.....	.....	.....
Canton, O., from Cleveland	20.76	20.76	20.26	21.26
Chicago from Birmingham	†19.72	.....	19.60	.....
Cincinnati from Hamilton, O.	20.58	20.58	20.08	.....
Cincinnati from Birmingham	20.20	.....	19.20	.....
Cleveland from Birmingham	19.62	.....	19.12	.....
Indianapolis from Hamilton, O.	21.93	21.93	21.43	22.43
Mansfield, O., from Toledo, O.	21.26	21.26	20.76	21.76
Milwaukee from Chicago	20.57	20.57	20.07	21.07
Muskegon, Mich., from Chicago Toledo or Detroit	22.60	22.60	22.10	23.10
Newark, N. J., from Birmingham	21.61	.....	.....	.....
Newark, N. J., from Bethlehem	21.99	22.49	.....	.....
Philadelphia from Birmingham	20.93	.....	20.81	.....
Philadelphia from Swedeland, Pa.	21.31	21.81	20.81	.....
Pittsburgh district from Neville Island	Neville base plus 67c, 81c and $1.21 switching charges			
Saginaw, Mich., from Detroit	21.75	21.75	21.25	21.25

Delivered from Basing Points:	No. 2 Fdry	Malleable	Basic	Bessemer
St. Louis, northern	20.00	20.00	19.50	.....
St. Louis from Birmingham	†19.68	.....	19.50	.....
St. Paul from Duluth	21.94	21.94	.....	22.44

†Over 0.70 phos.

Low Phos.

Basing Points: Birdsboro and Steelton, Pa., and Standish, N. Y., $24.00, Phila. base, standard and copper bearing, $25.13.

Gray Forge		Charcoal	
Valley furnace	19.00	Lake Superior fur.	$22.00
Pitts. dist. fur.	19.00	Do., del. Chicago	25.25
		Lylees, Tenn.	22.50

Silvery†

Jackson county, O., base; 6-6.50 per cent $22.75; 6.51-7—$23.25; 7-7.50—$23.75; 7.51-8—$24.25; 8-8.50—$24.75; 8.51-9—$25.25; 9-9.50—$25.75. Buffalo $1.25 higher.

Bessemer Ferrosilicon†

Jackson county, O., base: Prices are the same as for silveries, plus $1 a ton.

†The lower all-rail delivered price from Jackson, O., or Buffalo is quoted with freight allowed.

Manganese differentials in silvery iron and ferrosilicon. 2 to 3%, $1 per ton add. Each unit over 3%, add $1 per ton.

Refractories

Per 1000 f.o.b. Works

Fire Clay Brick

Super Quality

Pa., Mo., Ky.	$55.00

First Quality

Pa., Ill., Md., Mo., Ky.	$45.00
Alabama, Ga.	$38.00-45.00

Second Quality

Pa., Ill., Ky., Md., Mo.	40.00
Ga., Ala.	35.00

Ohio

First quality	$40.00
Intermediary	37.00
Second quality	28.00

Malleable Bung Brick

All bases	50.00

Silica Brick

Pennsylvania	$45.00
Joliet, E. Chicago	54.00
Birmingham, Ala.	48.00

Magnesite

Imported dead-burned grains, net ton f.o.b. Chester, Pa., and Baltimore bases (bags)	$45.00
Domestic dead-burned grains, net ton f.o.b. Chester, Pa., and Baltimore bases (bags)	40.00
Domestic dead-burned gr. net ton f.o.b. Chewelah, Wash. (bulk)	22.00

Basic Brick

Net ton, f.o.b. Baltimore, Plymouth Meeting, Chester, Pa.

Chrome brick	$45.00
Chemically bonded chrome brick	45.00
Magnesite brick	65.00
Chemically bonded magnesite brick	55.00

Fluorspar, 85-5

Washed gravel, duty paid, tide, net ton	$20.50
Washed gravel, f.o.b. Ill., Ky., net ton, carloads, all-rail	$18.00
Do., for barge	$19.00

Ferroalloys

Dollars, except Ferrochrome

Ferromanganese, 78-82% tidewater, duty paid	75.00
Do., Balti., base	75.00
Do., del. Pittsb'gh	80.13
Spiegeleisen, 19-20% dom. Palmerton, Pa., spot†	26.00
Do., New Orleans	26.00
Ferrosilicon, 50% freight all., cl.	69.50
Do., less carload	77.00
Do., 75 per cent	126-130.00
Spot, $5 a ton higher.	
Silicoman., 2½ carb.	85.00
2% carbon, 90.00; 1%,	100.00
Ferrochrome, 66-70 chromium, 4-6 carbon, cts. lb. del.	10.00
Ferrotungsten, stand., lb. con. del.	1.30- 1.40
Ferrovanadium, 35 to 40% lb., cont.	2.70- 2.90
Ferrotitanium, c. l., prod. plant, frt. allow., net ton	137.50
Spot, 1 ton, frt. allow., lb.	7.00
Do., under 1 ton	7.50
Ferrophosphorus, per ton, c. l., 17-19% Rockdale, Tenn., basis, 18%, $3 unitage	68.50
Ferrophosphorus, electrolytic, per ton c. l., 23-26% f.o.b. Anniston, Ala., 24% $3 unitage	75.00
Ferromolybdenum, stand. 55-65%, lb.	0.95
Molybdate, lb. cont.	0.80

†Carloads, Quan. diff. apply

Nonferrous

METAL PRICES OF THE WEEK

Spot unless otherwise specified. Cents per pound

	Copper: Electro, del. Conn.	Copper: Lake, del. Midwest	Copper: Casting, refinery	Straits Tin: New York Spot	Straits Tin: New York Futures	Lead: N. Y.	Lead: East St. L.	Zinc: St. L.	Aluminum 99%	Antimony: Chinese Spot, N. Y.	Nickel: Cathodes
May 9	9.50	9.62½	9.12½	46.65	45.12½	4.60	4.45	4.90	*19.00	13.50	35.00
May 11	9.50	9.62½	9.12½	46.70	45.00	4.60	4.45	4.90	19.00	13.50	35.00
May 12	9.50	9.62½	9.12½	46.95	45.00	4.60	4.45	4.90	19.00	13.50	35.00
May 13	9.50	9.62½	9.12½	46.90	45.00	4.60	4.45	4.90	19.00	13.50	35.00
May 14	9.50	9.62½	9.12½	46.87½	45.12½	4.60	4.45	4.90	19.00	13.50	35.00
May 15	9.50	9.62½	9.12½	46.87½	45.12½	4.60	4.45	4.90	19.00	13.50	35.00

*Nominal range 19.00 to 21.00c.

MILL PRODUCTS

F.o.b. mill base, cents per lb. except as specified. Copper brass products based on 9.00c Conn. copper.

Sheets	
Yellow brass (high)	15.12½
Copper, hot rolled	17.00
Lead cut to jobers	8.25
Zinc, 100-lb. base	9.50
Tubes	
High yellow brass	17.37½
Seamless copper	17.50
Rods	
High yellow brass	13.12½
Copper, hot rolled	13.75
Anodes	
Copper, untrimmed	14.50
Wire	
Yellow brass (high)	15.37½

OLD METALS

Deal. buying prices, cents lb.

No. 1 Composition Red Brass	
New York	6.25- 6.50
Cleveland	6.50- 6.75
Chicago	6.00- 6.25
St. Louis	6.00- 6.50
Heavy Copper and Wire	
New York, No. 1	7.75- 8.00
Chicago, No. 1	7.00- 7.50
Cleveland	6.75- 7.00
St. Louis, No. 1	7.25- 7.50
Composition Brass Borings	
New York	5.87½- 6.00
Light Copper	
New York	6.37½- 6.50
Chicago	5.50- 6.00
Cleveland	5.75- 6.00
St. Louis	5.50- 6.00
Light Brass	
Chicago	3.50- 3.75
Cleveland	3.25- 3.50
St. Louis	3.50- 4.00
Lead	
New York	3.50- 3.75
Cleveland	3.50- 3.75
Chicago	3.37½-3.62½
St. Louis	3.50- 4.00
Zinc	
New York	3.00-3.12½
Cleveland	2.25- 2.50
St. Louis	2.50- 3.00
Aluminum	
Borings, Cleveland	8.75- 9.00
Mixed, cast, Cleve.	12.25-12.50
*Mixed, cast, St. L.	12.75-13.25
*Clips, soft, Cleve.	14.00-14.50

SECONDARY METALS

Brass ingot, 85-5-5-5	9.50
*Stand. No. 12 alum.	16.50-16.75

Iron and Steel Scrap Prices

Corrected to Friday night. Gross tons delivered to consumers, except where otherwise stated

HEAVY MELTING STEEL

Birmingham	9.50-10.00
Boston, dock, expt.	10.50
Boston, domestic	9.50-10.25
Buffalo, No. 1	13.00-13.50
Buffalo, No. 2	12.00-12.50
Chicago, No. 1	12.50-13.00
Cleveland, No. 1	13.00-13.50
Cleveland, No. 2	12.00-12.50
Detroit, No. 1	10.25-10.75
Detroit, No. 2	9.50-10.00
Eastern Pa., No. 1	12.75-13.00
Eastern Pa., No. 2	12.00
Federal, Ill.	10.50-11.00
Granite City, R. R.	11.75-12.25
Granite City, No. 2	10.00-10.50
N. Y., brokers, No. 2	8.00- 8.50
N. Y., brokers, barge (No. 1 for export)	10.00
Pitts., No. 1 (R. R.)	15.25-15.75
Pitts., No. 1 (dlr.)	14.50-15.00
Pittsburgh, No. 2	13.25-13.75
St. Louis	11.00-11.50
Toronto, dealers	7.50
Valleys, No. 1	14.50-15.00

COMPRESSED SHEETS

Buffalo, dealers	12.00-12.50
Chicago, factory	12.00-12.50
Chicago, dealer	11.50-12.00
Cleveland	12.75-13.25
Detroit	11.00-11.50
E. Pa., new mat.	12.50-13.00
Pittsburgh	14.50-15.00
St. Louis	7.75- 8.25
Valleys	14.50-15.00

BUNDLED SHEETS

Buffalo	10.50-11.00
Cincinnati, del	7.75- 8.25
Cleveland	9.50-10.00
Pittsburgh	13.25-13.75
St. Louis	6.25- 6.75
Toronto, dealers	4.50

SHEET CLIPPINGS, LOOSE

Chicago	8.00- 8.50
Cincinnati	6.50- 7.00
Detroit	8.00- 8.50
St. Louis	5.50- 6.00

STEEL RAILS, SHORT

Birmingham	12.00-12.50
Buffalo	15.75-16.25
Chicago (3 ft.)	15.00-15.50
Chicago (2 ft.)	15.50-16.00
Cincinnati, del.	14.00-14.50
Detroit	15.00-15.50
Pitts., open-hearth, 3 ft. and less	16.25-16.75
St. Louis, 2 ft. & less	14.75-15.25

STEEL RAILS, SCRAP

Boston	9.00- 9.50
Chicago	12.50-13.00
Pittsburgh	15.00-15.50
St. Louis	12.75-13.25
Buffalo	13.00-14.00
Toronto, dealers	8.50

STOVE PLATE

Birmingham	7.00- 7.50
Boston, dealers	6.00- 6.25
Buffalo	11.00-11.50
Chicago	7.50- 8.00
Cincinnati, dealers	7.75- 8.50
Detroit, net	9.00- 9.50
Eastern Pa.	10.50
N. Y., brokers, fdry.	7.50- 7.75
St. Louis	7.50- 8.00
Toronto, dealers, net	5.50

COUPLERS, SPRINGS

Buffalo	14.75-15.25
Chicago, springs	14.50-15.00
Eastern Pa.	16.00-16.50
Pittsburgh	17.25-17.75
St. Louis	12.75-13.25

ANGLE BARS—STEEL

Chicago	14.00-14.50
St. Louis	12.75-13.25
Buffalo	14.50-15.00

RAILROAD SPECIALTIES

Chicago	14.50-15.00

LOW PHOSPHORUS

Buffalo, billet and bloom crops	15.00-15.50
Cleveland, billet, bloom crops	17.50-18.00
Eastern Pa., crops	16.50-17.00
Pittsburgh, billet, bloom crops	17.25-17.75
Pittsburgh, sheet bar crops	16.75-17.25

FROGS, SWITCHES

Chicago	12.50-13.00
St. Louis, cut	12.75-13.25

SHOVELING STEEL

Chicago	12.50-13.00
Federal, Ill.	10.50-11.00
Granite City, Ill.	10.00-10.50
Toronto, dealers	6.50

RAILROAD WROUGHT

Birmingham	7.50- 8.00
Boston, dealers	7.25- 7.50
Buffalo, No. 1	12.00-12.50
Buffalo, No. 2	13.00-13.50
Chicago, No. 1, net	12.00-12.50
Chicago, No. 2	12.50-13.00
Cincinnati, No. 2	10.75-11.25
Eastern Pa.	13.00-13.50
St. Louis, No. 1	10.25-10.75
St. Louis, No. 2	12.00-12.50
Toronto, No. 1, dlr.	7.00

SPECIFICATION PIPE

Eastern Pa.	12.00
New York, dealers	7.75- 8.00

BUSHELING

Buffalo, No. 1	12.00-12.50
Chicago, No. 1	12.00-12.50
Cinci., No. 1, deal.	8.50- 9.00
Cincinnati, No. 2	4.50- 5.00
Cleveland, No. 2	8.25- 8.75
Detroit No. 1, new	9.50-10.00
Valleys, new, No. 1	14.00-14.50
Toronto, dealers	6.00

MACHINE TURNINGS

Birmingham	5.50- 6.50
Boston, dealers	3.25- 3.50
Buffalo	7.00- 7.25
Chicago	6.00- 6.50
Cincinnati, dealers	5.75- 6.25
Cleveland	7.50- 8.00
Detroit	5.75- 6.25
Eastern Pa.	8.50
New York, brokers	3.50- 4.00
Pittsburgh	9.50-10.00
St. Louis	4.00- 4.50
Toronto, dealers	4.00
Valleys	10.00-10.50

BORINGS AND TURNINGS

For Blast Furnace Use

Boston, dealers	2.25- 2.50
Buffalo	8.50- 9.00
Cincinnati, dealers	5.75- 6.25
Cleveland	8.25- 8.75
Detroit	6.50- 7.00
Eastern Pa.	6.50- 7.00
New York, brokers	3.25- 3.75
Pittsburgh	8.75- 9.25
Toronto, dealers	4.00

CAST IRON BORINGS

Birmingham, plain	4.50- 5.50
Boston, chemical	6.00- 6.25
Boston, dealers	3.50- 4.00
Buffalo	8.00- 8.50
Chicago	6.00- 6.50
Cincinnati, dealers	5.25- 6.25
Cleveland	8.25- 8.75
Detroit	6.50- 7.00
E. Pa., chemical	11.00-13.00
New York, brokers	4.50- 5.00
St. Louis	4.00- 4.50
Toronto, dealers	5.00

PIPE AND FLUES

Cincinnati, dealers	7.75- 8.25
Chicago, net	7.50- 8.00

RAILROAD GRATE BARS

Buffalo	11.00-11.50
Chicago, net	8.50- 9.00
Cincinnati	7.00- 7.50
Eastern Pa.	10.50
New York, brokers	6.50- 7.00
St. Louis	7.50- 8.00

FORGE FLASHINGS

Boston, dealers	7.00- 7.25
Buffalo	12.00-12.50
Cleveland	13.00-13.50
Detroit	9.00- 9.50
Pittsburgh	13.50-14.00

FORGE SCRAP

Boston, dealers	6.00- 7.00
Chicago, heavy	14.50-15.00
Eastern Pa.	12.50-13.00

ARCH BARS, TRANSOMS

St. Louis	13.50-14.00

AXLE TURNINGS

Boston, dealers	5.75- 6.00
Buffalo	11.00-11.50
Chicago, elec. fur.	12.75-13.25
Eastern Pa.	12.00-12.50
St. Louis	9.00- 9.50
Toronto	4.50

STEEL CAR AXLES

Birmingham	11.50-12.50
Boston, ship. point.	11.00-11.25
Buffalo	15.50-16.00
Chicago, net	14.75-15.25
Eastern Pa.	17.00
St. Louis	13.00-13.50
Toronto	8.50

SHAFTING

Boston, ship point	13.25-13.50
Eastern Pa.	18.50-19.00
New York, brokers	14.25-14.50
St. Louis	13.50-14.00

CAR WHEELS

Birmingham	11.00-11.50
Boston, iron deal.	8.75- 9.00
Buffalo, iron	13.50-14.00
Buffalo, steel	15.75-16.25
Chicago, iron	13.25-13.75
Chicago, rolled steel	14.50-15.00
Cincinnati, iron	10.50-11.00
Eastern Pa., iron	14.00-14.50
Eastern Pa., steel	16.00-16.50
Pittsburgh, iron	14.25-14.75
Pittsburgh, steel	17.00-17.50
St. Louis, iron	11.50-12.00
St. Louis, steel	13.00-13.50
Toronto, net	8.50

NO. 1 CAST SCRAP

Birmingham	10.50-11.50
Boston, No. 1 mach.	9.25- 9.75
Boston, No. 2	9.50-10.00
Boston, tex. con.	11.50-12.00
Buffalo, cupola	12.25-12.75
Buffalo, mach.	13.25-13.75
Chicago, agri. net	10.00-10.50
Chicago, auto	11.50-12.00
Chicago, mach. net	12.00-12.50
Chicago, railr'd net	11.00-11.50
Cinci., mach. cup	10.75-11.25
Cleveland, mach.	16.00-16.50
Eastern Pa., cupola	14.00-14.50
E. Pa., mixed yard	12.00
Pittsburgh, cupola	14.50-15.00
San Francisco, del.	13.50-14.00
Seattle	10.00-11.00
St. Louis, No. 1	11.00-11.50
St. L., No. 1 mach.	12.00-12.50
Toronto, No. 1, mach., net	9.00

HEAVY CAST

Boston, del.	8.00- 8.25
Buffalo, break.	11.00-11.50
Cleveland, break	12.50-13.00
Detroit, No. 1 mach. net	13.00-13.50
Detroit, break.	11.00-11.50
Detroit, auto net	11.00-11.50
Eastern Pa.	13.00-13.50
New York, break. brokers	9.25- 9.50
Pittsburgh	13.50-14.00

MALLEABLE

Birmingham, R. R.	11.50-12.50
Boston, consum.	16.00-17.00
Buffalo	16.00-16.50
Chicago, R. R.	16.00-16.50
Cincinnati, agri. del.	12.50-13.00
Cleveland, rail	17.00-17.50
Detroit, auto, net	14.50-15.00
Eastern Pa., R. R.	17.00-17.50
Pittsburgh, rail	18.00-18.50
St. Louis, R. R.	14.00-14.50
Toronto, net	7.00

RAILS FOR ROLLING

5 feet and over

Birmingham	11.50-12.50
Boston, dealers	9.00- 9.50
Buffalo	13.00-14.00
Chicago	14.25-14.75
Eastern Pa.	15.00-15.50
New York, brokers	10.25-10.50
St. Louis	14.00-14.50

LOCOMOTIVE TIRES

Chicago (cut)	14.50-15.00
St. Louis, No. 1	12.00-12.50

LOW PHOS. PUNCHINGS

Buffalo	15.00-15.50
Chicago	15.00-15.50
Eastern Pa.	16.00-16.50
Pittsburgh (heavy)	17.00-17.50
Pittsburgh (light)	16.00-16.50

Iron Ore

Lake Superior Ore

Gross ton, 51½% Lower Lake Ports

Old range bessemer	$4.80
Mesabi nonbess.	4.50
High phosphorus	4.40
Mesabi bessemer	4.65
Old range nonbess.	4.65

Eastern Local Ore

Cents, unit, del. E. Pa.

Foundry and basic 56-63% con. (nom.)	8.00- 9.00
Cop.-free low phos. 58-60% (nom.)	10.00-10.50

Foreign Ore

Cents per unit, f.a.s. Atlantic ports (nominal)

Foreign manganiferous ore, 45.55% iron, 6-10% man.	10.50
No. Afr. low phos.	10.50
Swedish basic, 65%	9.50
Swedish low phos.	10.50
Spanish No. Africa basic, 50 to 60%	10.50
Tungsten, spot sh. ton unit, duty pd.	$15.85-16.00
N. F., fdy., 55%	7.00
Chrome ore, 48% gross ton, c.i.f.	19.25

Manganese Ore

(Nominal)

Prices not including duty, cents per unit cargo lots

Caucasian, 50-52%	26.00
So. African, 50-52%	26.00
Indian, 50-52%	26.00

Warehouse Iron and Steel Prices

Cents per pound for delivery within metropolitan districts of cities specified

STEEL BARS

Baltimore*	3.00c
Boston††	3.10c
Buffalo	3.00c
Chattanooga	3.36c
Chicago (j)	3.00c
Cincinnati	3.22c
Cleveland	3.00c
Detroit	3.09c
Houston	3.00c
Los Angeles	3.60c
Milwaukee	3.11c-3.26c
New Orleans	3.35c
New York‡ (d)	3.31c
Pitts. (h)	2.95c-3.10c
Philadelphia*	3.03c
Portland	3.50c
San Francisco	3.25c
Seattle	3.70c
St. Louis	3.25c
St. Paul	3.25c-3.40c
Tulsa	3.25c

IRON BARS

Portland	3.40c
Chattanooga	3.36c
Baltimore*	3.05c
Chicago	2.75c
Cincinnati	3.22c
New York‡(d)	3.36c
Philadelphia*	2.93c
St. Louis	3.25c
Tulsa	3.25c

REINFORCING BARS

Buffalo	2.60c
Chattanooga	3.36c
Chicago	2.10c-2.60c
Cleveland (c)	2.10c
Cincinnati	3.25c
Houston	3.25c
Los Ang., cl.	2.45c
New Orleans	3.50c
Pitts., plain (h)	3.05c
Pitts., twisted squares (h)	3.175c
San Francisco	2.45c
Seattle	2.45c
St. Louis	3.25c
Tulsa	3.25c
Young.	2.30c-2.60c

SHAPES

Baltimore*	3.00c
Boston††	3.19c
Buffalo	3.25c
Chattanooga	3.56c
Chicago	3.20c
Cincinnati	3.42c
Cleveland	3.31c
Detroit	3.42c
Houston	3.00c
Los Angeles	3.60c
Milwaukee	3.31c
New Orleans	3.55c
New York‡(d)	3.37c
Philadelphia*	2.98c
Pittsburgh (h)	3.15c
Portland (i)	3.50c
San Francisco	3.25c
Seattle (i)	3.70c
St. Louis	3.45c
St. Paul	3.45c
Tulsa	3.50c

PLATES

Baltimore*	3.00c
Boston††	3.21c
Buffalo	3.37c
Chattanooga	3.56c
Chicago	3.20c
Cincinnati	3.42c
Cleveland, ¼-in. and over	3.31c
Detroit	3.42c
Detroit, ⅜-in.	3.65c
Houston	3.00c
Los Angeles	3.60c
Milwaukee	3.31c
New Orleans	3.55c
New York‡(d)	3.40c
Philadelphia*	2.98c
Phila. floor	4.95c
Pittsburgh(h)	3.15c
Portland	3.35c
San Francisco	3.25c
Seattle	3.55c
St. Louis	3.45c
St. Paul	3.45c
Tulsa	3.50c

NO. 10 BLUE

Baltimore*	3.10c
Boston††	3.30c
Buffalo	3.62c
Chattanooga	3.36c
Chicago	3.05c
Cincinnati	3.22c
Cleveland	3.11c
Det., 8-10 ga.	3.14c
Houston	3.35c
Los Angeles	3.75c
Milwaukee	3.16c
New Orleans	3.55c
New York‡(d)	3.31c
Portland	3.35c
Philadelphia*	3.08c
Pittsburgh(h)	2.95c
San Fracisco	3.35c
Seattle	3.70c
St. Louis	3.45c
St. Paul	3.30c
Tulsa	3.70c

NO. 24 BLACK

Baltimore*†	3.60c
Boston (g)	3.95c
Buffalo	3.25c
Chattanooga	4.16c
Chicago	3.85c
Cincinnati	4.02c
Cleveland	3.91c
Detroit	3.94c
Los Angeles	4.35c
Milwaukee	3.96c
New Orleans	4.50c
New York‡(d)	3.89c
Philadelphia*†	3.60c
Pitts.** (h)	3.55c
Portland	4.10c
San Francisco	4.00c
Seattle	4.40c
St. Louis	4.10c
St. Paul	3.90c
Tulsa	4.75c

NO. 24 GALV. SHEETS

Baltimore*†	4.30c
Buffalo	4.00c
Boston (g)	4.65c
Chattanooga	4.86c
Chicago (h)	4.55c
Cincinnati	4.72c
Cleveland	4.61c
Detroit	4.72c
Houston	4.40c
Los Angeles	4.40c
Milwaukee	4.66c
New Orleans	4.95c
New York‡(d)	4.30c
Philadelphia*†	4.40c
Pitts.**(h)	4.15-4.45c
Portland	4.50c
San Francisco	4.50c
Seattle	5.00c
St. Louis	4.65c
St. Paul	4.50c
Tulsa	5.10c

BANDS

Baltimore*	3.20c
Boston††	3.30c
Buffalo	3.42c
Chattanooga	3.61c
Chicago	3.30c
Cincinnati	3.47c
Cleveland	3.36c
Detroit, ⅜-in. and lighter	3.39c
Houston	3.25c
Los Angeles	4.10c
Milwaukee	3.41c
New Orleans	3.95c
New York‡(d)	3.56c
Philadelphia	3.18c
Pittsburgh (h)	3.20c
Portland	4.25c
San Francisco	4.10c
Seattle	4.25c
St. Louis	3.55c
St. Paul	3.55c
Tulsa	3.45c

HOOPS

Baltimore	2.30c
Boston††	4.30c
Buffalo	3.42c
Chicago	3.30c
Cincinnati	3.47c
Det., No. 14 and lighter	3.39c
Los Angeles	5.85c
Milwaukee	3.41c
New York‡(d)	3.56c
Philadelphia	3.43c
Pittsburgh (h)	3.70c
Portland	5.60c
San Francisco	6.15c
Seattle	5.60c
St. Louis	3.55c
St. Paul	3.55c

COLD FIN. STEEL

Baltimore (c)	3.73c
Boston	3.90c
Buffalo (h)	3.55c
Chattanooga*	4.13c
Chicago (h)	3.50c
Cincinnati	3.72c
Cleveland (h)	3.50c
Detroit	3.79c
Los Ang. (f) (d)	5.85c
Milwaukee	3.61c
New Orleans	4.30c
New York‡(d)	3.81c
Philadelphia	3.76c
Pittsburgh	3.50c
Portland (f) (d)	6.15c
San Fran.(f) (d)	5.95c
Seattle (f) (d)	6.15c
St. Louis	3.75c
St. Paul	4.02c
Tulsa	4.65c

COLD ROLLED STRIP

Boston, 0.100-in., 500 lb. lots	3.245c
Buffalo	3.39c
Chicago	3.27c
Cincinnati (b)	3.22c
Cleveland (b)	2.85c
Detroit	3.18c
New York‡(d)	3.36c
St. Louis	3.45c

TOOL STEELS

(Applying on or east of Mississippi river; west of Mississippi 1c up)

	Base
High speed	57c
High carbon, high chrome	37c
Oil hardening	22c
Special tool	20c
Extra tool	17c
Regular tool	14c

Uniform extras apply.

BOLTS AND NUTS

(100 pounds or over)

	Discount
Chicago (a)	70
Cleveland	70
Detroit	70-10
Milwaukee	70
Pittsburgh	70

(a) Under 100 pounds, 65 off.

(b) Plus straightening, cutting and quantity differentials; (c) Plus mill, size and quantity extras; (d) Quantity base; (e) New mill classif. (f) Rounds only; (g) 50 bundles or over; (h) Outside delivery, 10c less; (i) Under 3 in.; (j) shapes other than rounds, flats, fillet angles, 3.15c.

‡Domestic steel; *Plus quan. extras; **Under 25 bundles; *†50 or more bundles; † New extras apply; ††Base 40,000 lbs., extras on less.

Prices on heavier lines are subject to new quantity differentials, 399 lbs. and less, up 50 cts.; 400 to 9999 lbs., base; 10,000 to 19,999 lbs., 15 cts. under; 20,000 to 39,999 lbs., 25 cts. under; 40,000 lbs and over, 35 cts. under base.

Current Iron and Steel Prices of Europe

Dollars at Rates of Exchange, May 14

Export Prices f. o. b. Ship at Port of Dispatch—(By Cable or Radio)

	British gross tons U. K. ports £ s d	Continental Channel or North Sea ports, metric tons Quoted in dollars at current value	**Quoted in gold pounds sterling £ s d
PIG IRON			
Foundry, 2.50-3.00 Silicon	$15.48 3 2 6*	$14.14	1 15 0
Basic bessemer	15.48 3 2 6*	12.11	1 10 0
Hematite, Phos. .03-.05	17.61 3 11 0	.....	.....
SEMIFINISHED STEEL			
Billets	$29.12 5 17 6	$18.99	2 7 0
Wire rods, No. 5 gage	42.39 8 19 0	36.37	4 10 0
FINISHED STEEL			
Standard rails	$40.92 8 5 0	$44.25	5 10 0
Merchant bars	1.71c 7 15 0	1.14c to 1.19c	3 2 6 to 3 5 0
Structural shapes	1.66c 7 10 0	1.12c	3 1 6
Plates, †¼ in. or 5 mm.	1.78c 8 1 3	1.55c	4 5 0
Sheets, black, 24 gage or 0.5 mm.	2.15c 9 15 0	2.12c	5 16 0††
Sheets, gal., 24 gage, corr.	2.60c 11 15 0	2.40c	6 10 0
Bands and strips	1.93c 8 15 0	1.42c	4 0 0
Plain wire, base	2.15c 9 15 0	1.92c	5 5 0
Galvanized wire, base	2.54c 11 10 0	2.15c	5 17 6
Wire nails, base	2.65c 12 0 0	1.74c	4 15 0
Tin plate, box 108 lbs.	$ 4.63 0 18 9	.....	.....

British ferromanganese $75 delivered Atlantic seaboard, duty-paid. German ferromanganese £9 0s 0d $(43.74) f.o.b.

Domestic Prices at Works or Furnace—Last Reported

	£ s d		French Francs		Belgian Francs		Reich Marks
Fdy. pig iron, Si. 2.5	$17.36	3 10 0(a)	$17.16	260	$13.91	410	$25.42 63
Basic bessemer pig iron	17.95	3 12 6(a)	12.54	190	11.97	350	28.05(b) 69.50
Furnace coke	5.21	1 1 0	6.27	95	4.14	122	7.67 19
Billets	29.12	5 17 6	28.38	430	18.83	555	38.95 96.50
Standard rails	1.82c	8 5 0	2.30c	671	1.53c	1,000	2.41c 132
Merchant bars	2.00c	9 1 0	1.67c	560	1.00c	650	2.01c 110
Structural shapes	1.93c	8 15 0	1.64c	550	1.00c	650	1.92c 107
Plates, †¼-in. or 5 mm.	2.00c	9 1 3	2.09c	700	1.23c	800	2.32c 127
Sheets, black	2.54c	11 10 0§	1.78c	600‡	1.34c	875‡	2.63c 144‡
Sheets, galv., corr., 24 ga. or 0.5 mm.	2.98c	13 10 0	2.84c	950	2.29c	1,500	6.76c 370
Plain wire	2.15c	9 15 0	2.68c	900	1.76c	1,150	3.16c 173
Bands and strips	2.17c	9 16 0	1.98c	650	1.23c	800	2.32c 127

*Basic. †British ship-plates. Continental, bridge plates. §24 ga. ‡1 to 3 mm. basic price. British quotations are for basic open-hearth steel. Continent usually for basic-bessemer steel. a del. Middlesbrough. b hematite. ††Close annealed.

**Gold pound sterling carries a premium of 66.00 per cent over paper sterling.

Bars

Bar Prices, Page 70

Pittsburgh — The merchant bar market reacted slightly last week. Present buying is testing the quantity differential method of bar pricing, which centers on a 1.85c, Pittsburgh, base for 3 to 25-ton lots for single shipment to one destination. Those classes of bar users now most prominently in the market include automotive partsmakers, manufacturers of home appliances and textile machinery. A wide improvement is shown in orders recently from farm implement and mine car manufacturers. The Norfolk & Western Railway Co. has an attractive inquiry out now for forgings in connection with a rolling stock program.

Cleveland—While about a week ago there was a dip downward in steel bar specifications, demand again has swung upward and regained its former level. Bars continue to move into a wide variety of uses with farm implement and auto industries taking most. Alloy steel bars keep up their continued activity under steady demand from gearmakers and others.

Chicago — Despite a downward tendency in steel bar specifications lately, demand continues at a relatively high rate. A decrease in automotive releases is not regarded as a permanent trend. Farm equipment manufacturers appear assured of practically full operations for another 30 to 60 days and what letdown develops thereafter is expected to be only moderate.

Philadelphia — Commercial steel bar demand is about on a parity with a week ago. While the trade generally does not expect an advance in third quarter, buyers are not sure and hence await developments around the beginning of next month, when sellers will begin to open books for third quarter.

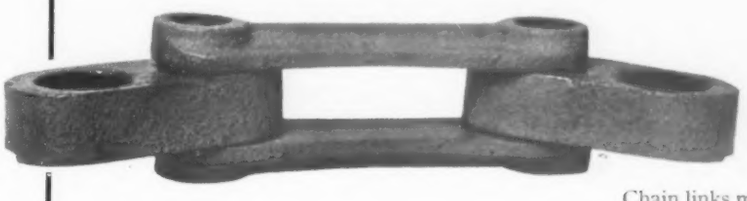
Plates

Plate Prices, Page 70

Pittsburgh—The two largest barge contracts on active inquiry at present, from the Ohio River Co., Cincinnati, and Standard Oil Co. of Louisiana, may eventually include the purchase of a towboat each. The Ohio River Co. has been inquiring for five 195-foot steel barges, which with a towboat would involve close to 2000 tons of plates. Standard Oil Co. of Louisiana has an inquiry out for two tank barges, which if augmented by a towboat, will mean a requirement of 800 to 900 tons of plates. Meanwhile, barge shops in the Pittsburgh district have built up substantial backlogs against heavy spring barge purchasing and several through last week were making initial deliveries against recent orders. The tank market is quiet, but plate prospects for the account of carbuilders are promising. The market is based on 1.80c, Pittsburgh, for plates and considerable discussion is heard of an advance in the third quarter.

Chicago—Plate buying has been heavier, aided by substantial orders for tanks, boilers and freight car building and repairs. Good prospects for a fairly substantial volume of railroad equipment buying during coming months aid the outlook for increased plate shipments to the carriers and car builders. The oil industry has a substantial construction program planned for this year, though details in some cases have yet to be disclosed.

New York — Miscellaneous plate tonnage still lags but about 8400 tons of rolled steel has been placed with mills in this district for 700



Chain links made from our Special "DD" Steel.

Strength!

Whether it's chain links, digger teeth, crusher bars, gears, clamshell or shovel buckets and dippers, pug mill knives, scraper bars or similar heavy duty castings, you will get maximum satisfaction from the strength and hardness of Damascus castings.

Our modern foundry is equipped with two 1½-ton Heroult electric furnaces with a capacity of 200 tons per month. We are prepared to produce castings of from one to 750 pounds in Manganese and Alloy Steels.

The DAMASCUS STEEL CASTING CO.
New Brighton, Pa.
(Pittsburgh District)

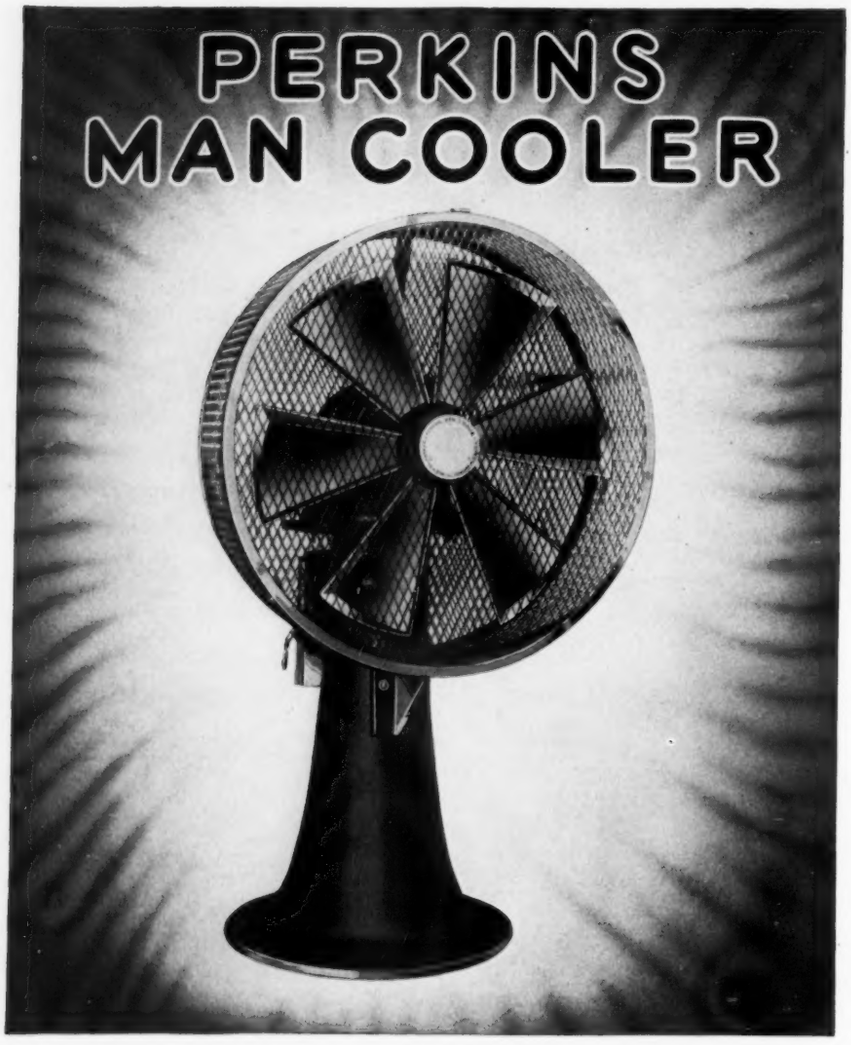
DAMASCUS STEEL CASTINGS
(Manganese and Alloy)

cars for the Erie, of which a fair proportion was plates. Low bidder on two ships for the Matson Line is expected to be announced before the end of this week.

Philadelphia—While the preponderance of trade opinion at the moment is that there will be no advance in third quarter, some regard it as more than a remote possibility. Meanwhile, consumers, figuring that they will have full time to cover, in the event of such possible advance, are continuing to buy lightly for their hand-to-mouth requirements.

San Francisco—Consolidated Steel Corp., Los Angeles, has booked 1200 tons for three 55,000-barrel tanks for the Texas Co., Los Angeles, and Chicago Bridge & Iron Works, Chicago, booked 150 tons for a 250,000-gallon tank on a 140-foot tower for Florence district, Los Angeles county, California. This brought the aggregate for the year to 67,324 tons as compared with 19,377 tons for the corresponding period in 1935.

Seattle—While no important projects are up for figures, the outlook has improved as several pulp plants in Washington and Oregon are planning extensions and replacements. Increased inquiry for steel items is coming from private industrial sources. Shipyard repair jobs are calling for larger tonnages of heavy plates.



Oscillating and Stationary Types—Hundreds of users of Perkins Man Coolers have proven for themselves the wisdom of investment in Perkins Man Coolers.

Readily moved from place to place, they bring comfort to men working in hot places, resulting in decreased labor turnover, increased production and fewer accidents.

B. F. PERKINS & SON, INC., Holyoke, Mass.
ENGINEERS AND MANUFACTURERS

Contracts Placed

1200 tons, three tanks for Texas Co., Los Angeles, to Consolidated Steel Corp., Los Angeles.

300 tons, tanks, Buffalo, to Chicago Steel Tank Co., Chicago.

250 tons, approximately, tanks, E. I. du Pont de Nemours Inc., Wilmington, Del., to Downington Iron Works, Downington, Pa.

150 tons, plates and shapes, 250,000-gallon tank on 140-foot tower, Florence district, Los Angeles, to Chicago Bridge & Iron Works, Chicago.

140 tons, elevated tank, Harwich, Mass., to Chicago Bridge & Iron Works, Chicago.

Contracts Pending

500 tons, steel decks for four double hangars, Hickman Field, T. H.; Robt. E. McKee, Los Angeles, low on general contract.

450 to 1350 tons, two to six 55,000-barrel tanks, new or used, Newkirk, N. Mex.; bids opened.

300 tons, East Marginal Way pipeline extension, Seattle; bids in.

100 tons, 6 to 12-inch 12-gage welded pipe, treasury department, San Francisco; bids opened.

Sheets

Sheet Prices, Page 70

Philadelphia—Formal award of 65,000 ton of hot-rolled heavy gage sheets, possibly the largest ever to be reported in this district, is likely to be announced shortly by the Edward G. Budd Mfg. Co., this city, the material to be used for Chevrolet car frames. The contract which the Budd company is reliably reported to have taken is considerably larger than the one received from Chevrolet a year ago, and includes passenger car as well as truck frames.

Late in June last year the Alan Wood Steel Co., Conshohocken, Pa., received an order for more than 35,000 tons of this work, with deliveries extending over a period of months, and with prices reported to be subject to quarterly adjustment to conform with the going market.

The Budd company is also about to place 500 tons of stainless steel for the 48 streamlined passenger cars on order for the Atchison, Topeka & Santa Fe.

Interest in the steel sheet trade centers on prices submitted recently to the state of Virginia on 240 tons of license tag stock on which the Gordon Metal Co., Richmond, Va., a jobber, was awarded the business. This award was on a draw with the Richmond Structural Steel Co., Richmond,

Va., on a price of 3.3325c, delivered, for resquared material shipped at one time.

Pittsburgh—Sheet mill operations remain at about 65-70 per cent, and May shipments have been equal to those of the same time in April. Sheet mills are now generally considering one week as being the practical interpretation of the "shipment at one time" clause under the quantity differential system of quoting. Base prices on sheets are all without change.

Cleveland — Steel sheet requirements of important tonnage consumers continue to crowd in upon Ohio mills. The new quantity extra is being accepted by most buyers with little argument and the quotation appears to be holding firmly.

Chicago — Sheet demand is well sustained, particularly from the automotive industry and other leading consumers. Mill operations are practically full and deliveries lately have become more extended. Brisk schedules are in prospect through June as a result of indicated automotive requirements. Quotations lately have shown more stability than at any time since the code era.

New York—Buying of steel sheets has been light the past week with uncertainty as to whether prices will be advanced for third quarter. Specifications are still fairly active.

Buffalo—Buffalo sheet mills show no slackening in the 85 per cent production rate they have maintained this month. There is pressure for shipment and new business of a type indicating this high rate may continue through the month, in which event sheet production here would set a high record for the past five years.

Cincinnati — Specifications for steel sheets are beginning to reflect a tapering from peak automobile demand. Other needs are steady so that withdrawal of one open hearth for a four per cent drop in steelmaking production just about represents the slackening trend. Requirements of manufacturers of household specialties are unaffected. Second quarter prices are not yet under discussion.

St. Louis — Sheet shipments and orders for the first two weeks of May were the largest for any fortnight this year. Some customers complain of slowness of delivery. Stove and implement makers account for liberal tonnages and outlet through the building industry shows moderate expansion.

Birmingham, Ala.—Sheet mills have maintained activity and shipments are almost equal to production. Agricultural sections are not as strong in the market as previously.

Pipe

Pipe Prices, Page 71

Pittsburgh — Oil country goods are a market highlight, and both mid-continent and West coast demand has been a feature. In addition, pipe lines for crude oil, should develop to the contract stage within the next few months. Demand for mechanical tubing has declined slightly, but standard pipe reflects a steady rate of specifications. Discounts on all tubular products are without change.

Chicago — Shipments against old orders for cast pipe continue heavy, and producers have sufficient backlogs to support an active movement for about six weeks. Deliveries lately have been in excess of incoming business, though additional buying is looked for during the next several months. Cicero, Ill., has taken bids on 5000 tons of various sizes, the pipe to be purchased by the successful contractor. Chicago is inquiring for 203 tons of fittings.

New York—Demand for cast pipe

SPECIAL SEAMLESS SHELLS AND SHAPES

AND

DEEP DRAWN TANKS, BOTTLES, ETC.

Is Our Specialty

This Seamless Drawn Tank is
A Crosby Accomplishment

Stamping Specialists Since 1896

An Experience You Should Not Overlook
Send Us Your Next Specification

THE CROSBY COMPANY

BUFFALO, N. Y.

NEW YORK — CHICAGO — PHILADELPHIA — DETROIT — CLEVELAND

is restricted to small lots. The only inquiry of any size is one for approximately 100 tons. Very little new buying is in sight at the moment.

Plans for construction of a 100-mile gas line from the new natural gas fields in northeastern Pennsylvania to the Eastman Kodak Co. plant in Rochester, N. Y., are in an advanced stage, involving a large pipe tonnage. Godfrey L. Cabot Inc., Boston, and the Pavillon Gas Co. are making plans for line.

Texas Empire Pipe Line Co., 135 East Forty-second street, New York, has awarded 41,000 tons, 10¾ and 12¾-inch welded pipe to Republic Steel Corp., Cleveland, and A. O. Smith Corp., Milwaukee, for installation between Kansas City and Chicago. Some 8-inch is also included. PWA funds have been requested for 12,000 to 15,000 tons of 44-inch steel pipe for Little Rock, Ark. Commissioners of District of Columbia will open bids May 1 to May 25 on 2000 tons of large-size steel water pipe, with certain alternates requested. A substantial tonnage of rail pipe will be requested soon for the automobile speedway on Long Island. Miscellaneous demand for commercial pipe is the best offered so far this year.

Birmingham, Ala. — Lettings are less numerous than a month ago, but pipe shops are busy and shipments are steady. These interests are carrying very little iron on yards but are getting every service from the blast furnaces as the material is needed.

San Francisco—Bids will be called soon for 304 miles of 6⅝ to 10¾-inch line pipe from Bakersfield to Martinez, Calif., for the Shell Oil Co., involving approximately 25,000 tons. A slight improvement is noted in demand for cast pipe. United States Pipe & Foundry Co., Burlington, N. J. is low on 268 tons of 12 and 16-inch pipe for San Diego, Calif.

Seattle—Demand for cast pipe shows no improvement, and few jobs of importance are pending. Municipal requirements are handicapped by lack of funds, in some instances due to complications over federal loans and grants. Seattle has opened bids for 175 tons of 8-inch for the East Marginal Way improvement. Renton and Poulsbo, Wash., have awarded small orders for cast iron and accessories. About 500 tons are pending on jobs, bids for which opened last month.

Steel Pipe Placed

41,000 tons, 10¾ and 12¾-inch welded pipe, to Republic Steel Corp., Cleveland, and A. O. Smith Corp., Milwaukee, for installation between Kansas City and Chicago.

Steel Pipe Pending

12,000 to 15,000 tons, 44-inch, for Little Rock, Ark.

2000 tons, large size, for District of Columbia; bids opened May 1 to May 25.

Cast Pipe Pending

5000 tons, various sizes; Cicero, Ill.

268 tons, 12 and 16-inch, San Diego, Calif.; United States Pipe & Foundry Co., Burlington, N. J., low.

203 tons, fittings for 3 to 24-inch pipe, Chicago; bids May 21.

100 tons, for department of purchase, New York; bids May 20.

Transportation

Track Material Prices, Page 71

Railroads in the market for freight cars, the total of whose inquiry a week ago was 11,700 cars, have not yet placed their orders, though a report is current that the Missouri Pacific has decided on the distribution of its 1500 box and 500 hopper cars.

Chesapeake & Ohio and Pere Marquette are tabulating bids on their inquiries for 5400 and 500, respectively, awards probably to be made during the present week.

Three important western roads,

NEW

- CONCENTRATION
- SEPARATION
- PURIFICATION
- PROTECTION
- POWER TRANSMISSION

DEVELOPMENTS BY STEARNS ENGINEERS IN MAGNETIC EQUIPMENT

THE TYPE DH

Because of its very deep, intensely concentrated magnetic field, finely ground or pulverized material—ores, clays, minerals—can be successfully refined, and magnetically reluctant particles removed with the Stearns Type DH Magnetic Separator. Operates with a magnetic drum lifting the magnetic particles, thus avoiding entrainment and keeping loss in the "tails" to a minimum. Automatic separation and discharge; has special vibrating device to provide proper feeding.

The Type DH is one of many recent developments in magnetic equipment by Stearns magnetic engineers. We maintain a fully equipped Magnetic Research and Testing Department . . . your magnetic problem, whether separation, processing, or power transmission—magnetically—will soon find a practical solution here.

Write for complete information.

Magnetic Mfg. Company,
650 S. 28th St.
Milwaukee, Wis.

"Whatever Your Magnetic Need . . . Whatever Your Magnetic Problem . . . Consult Stearns Magnetic."

HIGH STEARNS DUTY
MAGNETIC EQUIPMENT

Great Northern, Grand Trunk and Soo line, have not yet placed their 1936 rail requirements and some tonnage from them is expected soon. Rail tonnage this year has been unusually good and mills have been operating at a gratifying rate.

Present commitments of carbuilders' and railroads' own shops promise a busy midyear, following an unusually busy fall and winter.

Car Orders Pending

Southern Pacific, 20 horse express cars; bids asked.

Locomotives Pending

Southern Pacific, 12 freight and six passenger locomotives; bids asked.

Wire

Wire Prices, Page 71

Pittsburgh—A few more second-quarter contracts are now being entered by wire product consumers and more test has been given the market on both merchant and manufacturing wire items. Certain irregularities continue in merchant items where, as in a recent New York state purchase of nails, jobbing outlets have quoted prices at variance with the official market. Cleveland continues $2.10 per keg for nails in straight or mixed carloads, $2.60 for galvanized barbed wire, and $58 per column for woven wire fence, with manufacturing wire items named at 2.40c, base, on plain wire and 3.05c for spring wire.

Chicago—Changes in specifications for wire and wire products are slight and both buying and shipments hold at the recent high level. Producers anticipate some letdown in consumption soon, despite indications of continued heavy schedules in the automotive industry through June. Wire products are in better demand in farm districts than during the past several years, though activity in some sections is quiet.

Strip Steel

Strip Prices, Page 71

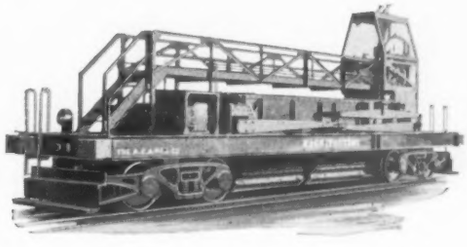
Pittsburgh—Stocks of strip steel in the hands of stamping shops are being carried at a low aggregate in many cases. In turn, users' specifications, by their narrow week-to-week fluctuations, show that no large inventories exist. Consequently, the market of 1.85c, Pittsburgh, for hot-rolled strip steel, and 2.60c, Pittsburgh or Cleveland, for cold-rolled strip is being frequently tested. In aggregate, specifications for strip last week declined slightly as some automotive partsmakers were receiving smaller releases against June needs. Operations in the strip industry are down to 55-60 per cent, as against 60-65 per cent a week ago.

New York — Demand for narrow strip is fairly brisk although specifications from automotive accessory manufacturers are off from early May.

Cleveland — Strip steel buying shows no sign of diminution, with specified commitments extending in several instances well into June. This applies as well to hot as to cold rolled strip. While most tonnage is going into wide widths, yet narrow and medium widths provide satisfactory tonnage. Some mills today can offer no earlier than August delivery.

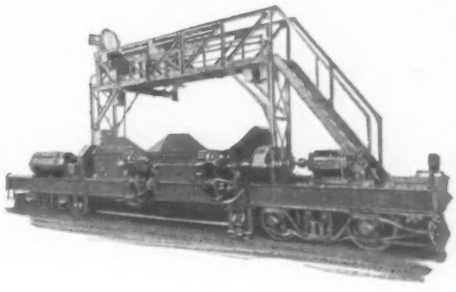
Chicago — Strip specifications have tended downward lately, though automotive requirements remain heavy. Miscellaneous consumers are less active in some instances. Little indication is given of third quarter prices despite the recent talk of a probable advance on various steel products. Quotations currently are steady.

ATLAS SCALE CARS



20 Ton — Double Compartment Scale Car. Journals provided with self aligning anti-friction bearings. Equipped with Atlas Indicator and Recorder.

20 Ton Two Compartment Scale Car with Orr Bin Gate Operating Mechanism. Anti-friction bearings. Equipped with Atlas Indicating and Recording Mechanism.



Other Atlas Products

Gas-Electric and Diesel-Electric Locomotives—Car Pushers—Storage Battery Locomotives—Electrically Operated Industrial Cars—Scale Cars and Weighing Cars of all kinds — Ore Transfer Cars and Blast Furnace Charging Cars.

Coke Oven Equipment

Pushers and Levelers—Coal Charging Cars—Door Handling Machines — Coke Quenching Cars.

Also Atlas Patented Indicating and Recording Mechanism for Weighing Scales.

THE ATLAS CAR & MFG. CO.

Engineers *Manufacturers*

CLEVELAND, OHIO

Shapes

Structural Shape Prices, Page 70

New York—Awards aggregated about 4000 tons. Eastern fabricators are all operating shops on active schedules because of accumulation of business in the past few months. With a large amount of tonnage pending, outlook for the indefinite future in the market is good. The market on plain structural shapes continues unchanged and firm at 1.90c, base, Bethlehem, Pa. While foreign shapes continue obtainable at lower prices they do not comprise any substantial part of the going tonnage.

Pittsburgh—Jones & Laughlin Steel Corp. requirements of 15,000 tons for the building to house its new continuous sheet mill here has in part been allocated with the decision by the company to fabricate about 2000 tons itself and to allocate about 3000 tons to Fort Pitt Bridge Works. The balance, 9000 tons, will be distributed soon. Formal award on the 2800-ton Westinghouse Electric & Mfg. Co. warehouse at Mansfield, O., on which American Bridge Co. is low, has not yet been made.

Chicago—Placing of 15,000 tons for the outdoor drive development to the two leading fabricators features the local market. Included in the outer drive work is a bascule bridge over the Michigan canal. Other awards are light and fabricators have only small lots among new inquiries to figure. Specifications for plain material, however, recently have been near the best volume for the year as a result of increased shipments against contracts booked by fabricators earlier this year.

Philadelphia—Placing of 5300 tons for a vocational school with the American Steel Engineering Co. features structural awards. While action has been taken on the bars, John McShain, local contractor, as yet has made no disposition of the 1500 tons of shapes for the engraving building in Washington, although indications point to a district fabricator. Prices are unchanged.

Cleveland — Libbey- Owens - Ford Glass Co., Toledo, O., has announced a $700,000 building expansion at its Rossford and East Toledo, O., plants, requiring considerable steel. Contractors' estimates are to be ready by June 15.

St. Louis — Lettings have fallen off, but fabricating shops still have good backlogs, and operations continue at the recent high levels, particularly by smaller concerns, which have booked orders for a number of lesser projects.

San Francisco—Structural awards included 623 tons for the Santa Margarita river bridge, San Diego county, Calif., 600 tons for two sound stages for the Century-Fox Film Corp., Los Angeles, and 719 tons of steel sheet piling for the bureau of reclamation, for delivery at Potholes, Calif.

Seattle—The First Narrows bridge at Vancouver, B. C., estimated to require 11,000 tons of structurals, is the largest steel job developed in the Pacific Northwest this year. Plans are being completed for the $6,000,000

Behind the Scenes with STEEL

Good Neighbor

WELCOME MAT should have been tossed out here last week for a new neighbor to appear at regular intervals on the page opposite this faltering department. We refer to the Bausch & Lomb Optical Co., builder of swell microscopes, optical instruments and stuff.

It's hard to say why the B. & L. people wanted to spot their message opposite us. Our guess is that they figured anyone who pored over this six-point type every week would soon have need of optical instruments, such as a binocular-oil-immersion-lens-ultraviolet-microscope, and by glancing at the opposite page they would quickly see where to get their eye-aids.

As a matter of passing interest, we find that regular use of Col. Stoopnagle's patented foithboinders is an invaluable aid in deciphering our small-size type.

Anyhow, welcome B. & L., we'll be seeing you.

* * *

"F" Hunt

TAKE a careful look at the following sentence and then note how many times the letter "f" appears in it. When you have ascertained the total, do not write us and tell us about it, because we know already. Here is the sentence:

This famous finish is the result of scientific study combined with the experience of years.

Valentine & Co., the Valspar people, are using the test in some of their literature. We looked it over and discovered three letter f's and then added on six just to be on the safe side.

After more careful observation we arrived at the correct number which is—but why spoil the thing? In case you're interested, we'll tell you next week.

* * *

Nine Years Old

MIRRORS OF MOTORDOM (see p. 25) is probably one of the most widely read and acclaimed features ever instituted by a business paper. It was originated in *Iron Trade Review* (STEEL'S daddy) away back in 1927—June 2, to be exact. This intimate picture of behind-the-scenes activity in motordom, later copied by numerous other business papers, is now approaching its ninth anniversary, and in this brief space of time has attained signal recognition, as attested by the thousands of comments received unsolicited since its inception.

Advertisers have recognized this appeal, and you will now notice advertisements each week on pages adjacent to *Mirrors of Motordom*.

Here is also a neat opportunity for these advertisers to work a so-called "copy tie-up" with the editorial pages, and the opportunity has not been overlooked. Witness Bullard's heading, "Reflections," in last week's issue; and Tinnerman's "Production Notes" this week. Smart fellers, these advertising boys.

* * *

INQUISITIVE CAMERA DEPT.—III

Associate Editor G. H. "Doc" Manlove keeping tab on his index file. Doc, a regular contributor to this department, has been hitting the ball for STEEL *and its predecessor Iron Trade Review for 23 years plus.*

* * *

Consciousness

RECENT bulletin of the Glycerine Producers' association says that the public is becoming glycerine-conscious. As one whose sole connection with glycerine has been in the smoothing-out of bathtub gin in years gone by, we are glad to know that the general public is catching on to many other uses for this material.

The public is also becoming STEEL-conscious, if mounting circulation figures, advertising volume and flow of inquiries are any indication. We don't know how much glycerine you could buy for 5.7 cents per week, but we do know that for that price you can buy a whale of a lot of information of value. That's the weekly cost of a two-year subscription to STEEL—$6 total. Look for the card between pages 50 and 51, and learn how easy it is to join up.

—SHRDLU

Shape Awards Compared

	Tons
Week ended May 15	40,039
Week ended May 8	13,290
Week ended May 1	14,884
This week, 1935	12,907
Weekly average, 1935	17,081
Weekly average, 1936	20,414
Weekly average, April	16,431
Total to date, 1935	299,576
Total to date, 1936	408,274

project, bids are expected in August, and award a month later. Completion is planned for September 1938. The main center span will be 1500 feet, with side spans each 575 feet. Two 400-foot towers will carry the spans. John Anderson, Royal Bank building, is Vancouver representative of British interests financing the improvement. Fabricating plants in this area are generally busy.

Shape Contracts Placed

15,000 tons, outer drive link, Chicago; 8000 tons for subdivisions 2, 4 and 5, including bascule bridge, to American Bridge Co., Pittsburgh; 7000 tons for subdivisions 1 and 3 to Bethlehem Steel Co., Bethlehem, Pa. Erection contract to Great Lakes Dredge & Dock Co., Chicago.

5300 tons, vocational school, Ninth and Mifflin streets, Philadelphia, through McCloskey & Co., that city, to the American Steel Engineering Co., Philadelphia; this latter interest also received order for the 1700 tons of rail steel bars required.

5000 tons, initial requirements out of an estimated total requirement of 15,000 tons, mill building for new continuous sheet mill, Pittsburgh, for Jones & Laughlin Steel Corp., Pittsburgh; 3000 tons to Fort Pitt Bridge Works, Pittsburgh, and 2000 tons to Jones & Laughlin fabricating shops.

2825 tons, warehouse, Westinghouse Electric & Mfg. Co., Mansfield, O., to American Bridge Co., Pittsburgh.

2100 tons, Kings county hospital, nurses home and training school, Brooklyn, N. Y., to Ingalls Iron Works Co., Birmingham, Ala.; tonnage revised from report in STEEL, May 4, listing award of 1600 tons.

1825 tons, public school No. 239, Brooklyn, N. Y., to Lehigh Structural Steel Co., Allentown, Pa.

1401 tons, sheet piling, bureau of reclamation, Potholes, Calif., to various producers, including 719 tons placed with Inland Steel Co., Chicago.

960 tons, Sixty-third street bridge, Kansas City, Mo., for state of Missouri, to Kansas City Structural Steel Co., Kansas City.

860 tons, state highway bridge, Detroit, to American Bridge Co., Pittsburgh.

840 tons, Fargo-Morehead bridge, North Dakota, to American Bridge Co., Pittsburgh.

750 tons, pier shed, Wilmington, Calif., to Minneapolis-Moline Power Implement Co., Minneapolis.

725 tons, state highway bridge, Bedford, O., to Fort Pitt Bridge Works, Pittsburgh.

700 tons, bridge, Jackson county, Missouri, to Kansas City Structural Steel Co., Kansas City, Mo.

623 tons, Santa Margarita river bridge, San Diego county, California, to Virginia Bridge & Iron Co., Roanoke, Va.

620 tons, Shark river bridge, New Jersey, to Virginia Bridge Co., Roanoke, Va.

600 tons, two sound stages for Century-Fox Film Corp., Los Angeles, to Consolidated Steel Corp., Los Angeles.

520 tons, state highway bridge, Schenectady, N. Y., to American Bridge Co., Pittsburgh.

500 tons, state bridge, route 11, Luzerne county, Kingston, Pa., to Bethlehem Steel Co., Bethlehem, Pa.

500 tons, various small contracts, miscellaneous public work and private plants, to Isaacson Iron Works, Seattle.

410 tons, bridge, Neosho county, Kansas, to Missouri Valley Bridge & Iron Co., Leavenworth, Kans.

410 tons, state highway bridge, Pueblo, Colo., to Minneapolis-Moline Power Implement Co., Minneapolis.

350 tons, state highway bridge, Nassau county, New York, to Norton Steel Co., New York.

335 tons, power plant, Welfare island, New York, to Weatherly Steel Co., Weatherly, Pa.

280 tons, alterations to switch house, Ford Motor Co., Dearborn, Mich., to Wisconsin Bridge & Iron Co., Milwaukee.

275 tons, Horace Mann school, Pasadena, Calif., to Pacific Iron & Steel Co., Los Angeles.

235 tons, overpass, Clay county, Kansas, to Missouri Valley Bridge & Iron Co., Leavenworth, Kan.

210 tons, Pennsylvania state highway bridge, Osceola, Pa., to Phoenix Bridge Co., Phoenixville, Pa.

210 tons, state highway bridge, Kimell, Ind., to Bethlehem Steel Co., Bethlehem, Pa.

200 tons, Westinghouse Memorial high school, Wilmerding, Pa., to Pittsburgh Bridge & Iron Works, Pittsburgh.

195 tons, coal bunkers, Cincinnati Gas & Electric Co., Cincinnati, to L. Schreiber Sons Co., Cincinnati.

160 tons, deck plate girder bridge, Norfolk & Western railroad, Garden creek,

"A.W." ROLLED STEEL FLOOR PLATE

Diamondette pattern shown actual size.

Available also in Super-Diamond, Diamond, and other patterns.

LOW FIRST COST—NO MAINTENANCE COST

Quick installation without disturbing men or production. Cut to any required shape. Slip proof, oil proof, heat proof, crack proof. Toughest traffic can't damage or impair it. PERMANENT. Immediate delivery, in various patterns to meet all requirements.

ALAN WOOD STEEL COMPANY

CONSHOHOCKEN, PA.

BRANCHES:

Philadelphia, New York, Boston, Los Angeles, San Francisco, Seattle, Houston

110 YEARS' IRON- AND STEEL-MAKING EXPERIENCE

Maryland, to Virginia Bridge Co., Roanoke, Va.

150 tons, bridge, Platte county, Wyoming, to Midwest Steel & Iron Works Co., Denver.

150 tons, addition to Pacific Manifold Book Co. plant, Emeryville, Calif., to Golden Gate Iron Works, San Francisco.

150 tons, alterations to Pacific Mutual Life Insurance building, Los Angeles, to Consolidated Steel Corp., Los Angeles.

140 tons, overpass, Panola county, Texas, to Austin Bros., Dallas, Tex.

140 tons, overpass, Smith county, Texas, to Mosher Steel & Machinery Co., Dallas, Tex.

140 tons, alterations to New York state garage, New York, to American Bridge Co., Pittsburgh.

135 tons, overpass, Ellis county, Texas, to Mosher Steel & Machinery Co., Dallas, Tex.

135 tons, bridge control, Polk county, Texas, to Austin Bros., Dallas, Tex.

130 tons, underpass, Lipscomb county, Texas, to Mosher Steel & Machinery Co., Dallas, Tex.

125 tons, Augusta boulevard grade crossing, Chicago, to Mississippi Valley Structural Steel Co., Chicago.

115 tons, underpass, Harris county, Texas, to Mosher Steel & Machinery Co., Dallas, Tex.

110 tons, state highway bridge, Warrick county, Illinois, to Vincennes Steel Corp., Vincennes, Ind.

100 tons, state bridge, route 25, Kinkora, N. J., to Bethlehem Steel Co., Bethlehem, Pa.

Shape Contracts Pending

11,000 tons, First Narrows bridge, Vancouver, B. C., limited to Canadian materials; John Anderson, Royal Bank building, Vancouver, local representative; bids expected in August.

5000 tons, Philadelphia public school; Fort Pitt Bridge Works, Pittsburgh, low.

2800 tons, warehouse addition, Mansfield, O., for Westinghouse Electric & Mfg. Co., East Pittsburgh, Pa.; American Bridge Co., Pittsburgh, low.

1600 tons, five state highway bridges, scattered locations, New York.

1500 tons, bureau of engraving and printing building, Washington, John McShain, Philadelphia, general contractor, expected to close shortly; this contractor has just awarded 6500 tons of rail steel bars for this project.

600 tons, grade crossing, Chicago.

525 tons, state bridges, Minnesota.

467 tons, over-crossing, Sacramento, Calif.; bids May 27.

400 tons, building for National Supply Co., Toledo, O.

325 tons, bridges, Winton Place, O., and Cuba, O., for Baltimore & Ohio railroad.

300 tons, mill building, United States Gypsum Co., Heath, Mont.

230 tons, state bridge, Pasco, Wash.; bids at Olympia, Wash., May 26.

220 tons, Ohio state highway bridge, Kent, O.

190 tons, state highway bridge, Oskaloosa, Iowa.

153 tons, plate girders, Coffeyville, Kans.

152 tons, under-crossing, Rivera, Los Angeles county, California; bids May 28.

147 tons, comprised of 81 tons of fabricated structural steel and 66 tons of plain steel bars, encased I-beam overpass bridge, Ephrata township, Lancaster county, Pennsylvania; Harry T. Campbell Sons Co., Towson, Md., low at $135,202.55 on May 8 bid.

138 tons, truss spans, Meaker, Colo.

123 tons, sheet piling, proposal 616, United States engineer office, Los Angeles; Bethlehem Steel Corp., Bethlehem, Pa., low.

100 tons, radial gates, Cle Elum, Wash.

Unstated tonnage, navy radio station, Oahu island, T. H.; bids soon.

Unstated tonnage, 503-foot state bridge, Missoula river, Mont.; Portland Bridge Co., Portland, Oreg., low.

Unstated tonnage, 229-foot state bridge, Musselshell river, Mont.; Cahill & Mooney, Butte, Mont., low.

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Reinforcing

Reinforcing Bar Prices, Page 71

New York—Lettings were comprised mainly of one lot of 750 tons and two lots of 200 tons each. There is a fair demand for small tonnages. The price on new billet bars as a rule is 2.05c base, Pittsburgh, or 2.40c delivered, New York, which becomes 2.50c when the trucking charge to the building site of such orders is added; however, this level is shaded on occasion. New projects are coming out slowly.

Pittsburgh—Low bidders on the May 8 state letting for Pennsylvania highway work, involving approximately 100 tons, were Harry T Campbell Sons Co., Towson, Md., in line for the Lancaster county job taking 65 tons, F. D. Kessler Inc., Northumberland, Pa., for the Northumberland county job, which requires 15 tons, and A. J. Fasenmyer, Erie, Pa., low on Erie county work with 10 tons of bars needed. About 100 tons of reinforcing steel are on inquiry in the Liberty public school, Pittsburgh. The new billet reinforcing steel bar market nominally ranges 1.95c to 2.05c, base, Pittsburgh.

Cleveland—Except for several lots of 100 tons or more for grade crossing approaches still hanging fire, most of the current demand for reinforcing bars in this area is for smaller lots. However, both road and concrete building construction is picking up under the stimulus of favorable weather.

Chicago—Shipments against old contracts are heavy and in excess of incoming business. Additional orders for highway construction and other public projects are indicated by plans now being prepared for such projects. A government appropriation for the building of Mississippi river dams in connection with locks already built appears assured of passage, and bids for such construction are expected to be asked during the next several months. Private building involves

Concrete Awards Compared

	Tons
Week ended May 15	15,314
Week ended May 8	2,391
Week ended May 1	4,679
This week, 1935	2,257
Weekly average, 1935	6,862
Weekly average, 1936	7,326
Weekly average, April	4,756
Total to date, 1935	99,255
Total to date, 1936	146,514

only small individual lots of bars and little increase is noted in the number

Philadelphia—With the placing of 8200 tons of rail steel bars for two jobs, reinforcing bar business was the best in some time. The principal award involved 6500 tons for the bureau of engraving and printing building, Washington, placed through John McShain, with the Sweets Steel Co., Williamsport, Pa., while the second largest involved 1700 tons for a local vocational school, placed through McCloskey & Co. with the American Steel Engineering Co. Several other awards of fair size were placed. Pending tonnage is light. Recent awards revealed stronger prices.

San Francisco—Recent awards by the bureau of reclamation for the All American canal project, Potholes, Calif., total over 1000 tons. Bethlehem Steel Co. took 230 tons for the Arrowrock dam in Utah.

Seattle—Market conditions are unchanged. New business is not imposing in volume and tonnages pending are small. The week's largest booking in the Pacific Northwest went to the Columbia Steel Co., 450 tons, for the women's gymnasium, Washington State College, Pullman, Hoard Engineering Co., Seattle, general contractor. Business pending includes 240 tons for the Salem, Oreg., water reservoir and 100 tons for a Washington state bridge, Chelan county, bids May 26.

Reinforcing Steel Awards

6500 tons, rail steel bars, bureau of engraving and printing building, Washington, through John McShain, Philadelphia, general contractor, to the Sweets Steel Co., Williamsport, Pa.; 1500 tons of shapes are still pending.

1750 tons, boardwalk and comfort station, Long Beach, N. Y., to Joseph T. Ryerson & Son Inc., Chicago, through Faircroft Engineering Co., Brooklyn, N. Y.

1700 tons, rail steel bars, vocational school, Ninth and Mifflin street, Philadelphia, awarded through McCloskey & Co., general contractor, that city, to the American Steel Engineering Co., Philadelphia, which also closed on the 5300 tons of structural shapes required.

1613 tons, bureau of reclamation, Potholes, Calif., distributed to various producers, including 317 tons to Colorado Fuel & Iron Co., Pueblo, Colo., 171 tons to Soule Steel Co., Los Angeles, 149 tons to Bethlehem Steel Co., Bethlehem, Pa., and 128 tons to Blue Diamond Corp., Los Angeles.

647 tons, rail steel bars, veterans hospital, Canandaigua, N. Y., through Erwin & Leighton, Philadelphia, to the American Steel Engineering Co., that city.

450 tons, women's gymnasium, Washington State college, Pullman, Wash., to Columbia Steel Co., Seattle; Hoard Engineering Co., Seattle, contractor.

260 tons, bureau of reclamation, invitation 38, 225-A, for Columbia Basin, Wash., to Carnegie-Illinois Steel Corp., Pittsburgh.

247 tons, bureau of reclamation, invitation 38, 215-A, for Columbia Basin, Wash., to Colorado Fuel & Iron Co., Pueblo, Colo.

243 tons, bureau of reclamation, invitation 38, 202-A, for Columbia Basin, Wash., to Northwest Steel Rolling Mills, Seattle.

230 tons, bureau of reclamation, invitation 21513, Arrowrock dam, Utah, to Bethlehem Steel Co., Bethlehem, Pa.

225 tons, boiler house addition, Viscose Co., Marcus Hook, Pa., to Concrete Steel Co., New York.

200 tons, billet bars, office building, E. I. du Pont de Nemours & Co. Inc., Wilmington, Del., through the Winslow Construction Co., Philadelphia, to Taylor Steel & Wire Co., Philadelphia.

200 tons, Horace Mann school, Pasadena, Calif., to unnamed interest.

200 tons, Pennsylvania railroad building, Newark, N. J., to Igoe Bros. Inc., Newark, through J. Rich Steers Inc., New York.

200 tons, to W. Ames & Co., Jersey City, N. J., through procurement division, treasury department, New York.

127 tons, high school, Alameda, Calif., to Gunn, Carle & Co., San Francisco.

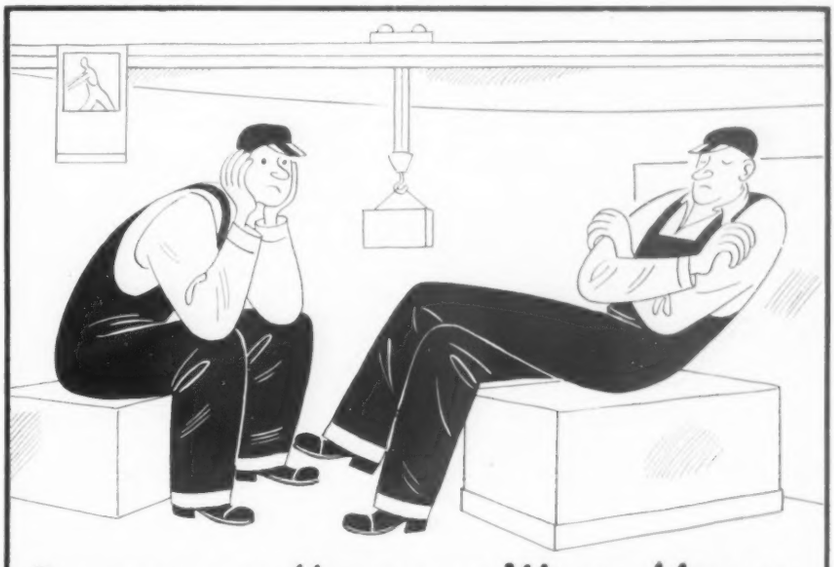
122 tons, state highway work in Contra Costa and in Orange county, California, to unnamed interest.

100 tons, alterations to Alexandria avenue school, Los Angeles, to unnamed interest.

100 tons, addition to high school, San Pedro, Calif., to unnamed interest.

100 tons, state paving, King county, Washington, to Northwest Steel Rolling Mills, Seattle.

100 tons, billet bars, Sylvania Corp.,



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Reinforcing Steel Pending

1220 tons, retaining wall, Naples Canal, Long Beach, Calif.; R. E. Campbell, Los Angeles, general contractor.
900 tons, Harlem housing project, New York; bids May 18.
412 tons, Verdugo road district junior high school, Los Angeles; bids soon.
355 tons, Rio Hondo bridge near El Monte, Los Angeles county, California; bids May 28.
228 tons, highway work, Abington and Lower Moreland townships, Montgomery county, Pennsylvania; bids to state highway department, Harrisburg, Pa., May 29.
100 tons, state overpass, Chelan county, Washington; bids at Olympia, Wash., May 26.
100 tons, bridge for Essex county park commission, Newark, N. J.
100 tons, administration building, Mills Field, San Francisco; bids opened.
100 tons, state over-crossing, Sacramento, Calif.; bids May 27.
Unstated, highway tunnel, Bonneville project; Orino, Birkemeier & Saramel, Bonneville, Oreg., general contractors.
Unstated, 167-foot concrete overpass, Roundup, Mont.; Collins & Dalvin, Billings, Mont., low.

Cold Finished

Cold Finished Prices, Page 71

Pittsburgh—Well-diversified consumption of cold-finished steel bars is indicated from the present rate of specifications, which include a wide range of users other than the automotive industry and a better proportion from textile machinery makers. The current market is based on 2.10c, Pittsburgh, for 5 to 10-ton lots of a single size and grade to be shipped at one time to one destination.

Pig Iron

Pig Iron Prices, Page 72

Pittsburgh—Shipments to date this month have been slightly ahead of April, but lack any outstanding local orders or inquiries. Companies manufacturing steel mill rolls, heavy railroad castings, air brakes, and parts for steel rolling mills are busy, and their requirements are the most consequential.

Cleveland—Shipments of pig iron both from steelworks and merchant furnaces, are sustained in satisfactory volume. Total shipments in May promise to exceed April by about 15 per cent. Auto partsmakers continue to keep up an unbroken stream of specifications. Gray iron and malleable jobbing foundries are broadening activities.

Chicago—Shipments to date are about 10 per cent heavier than in the comparable April period, and with foundry operations well maintained and new business improving, deliveries are expected to gain through June. Automotive, farm equipment, railroad parts, machine tool and sanitary ware manufacturers are leaders in sustaining operations. While new buying is for small lots, orders are more numerous as additional foundries reduce stocks. Prices are firm.

New York—Pig iron buying continues dull, with volume so far this month under the April rate. Despite a softening tendency in export prices, the domestic market is unchanged.

Philadelphia—Light buying continues to characterize the market here. Foundry melt is being well sustained, and sellers are still looking for an improvement in volume, as stocks on hand at a number of plants become absorbed. Prices are unchanged.

Buffalo—Foundries catering to the automotive trades report increasing business, as do those which sell to the railroads. Melt has been gaining steadily and is now near the peak of the year. May deliveries are up 10 to 20 per cent from April. Shipments are being made steadily by barge canal, and some lake tonnage also will be loaded this month. Ice and fog continued to make Great Lakes operations slow and hazardous the past week, and ore carriers were subject to long delays.

Cincinnati—Prompt shipment is being demanded on small-lot orders, the total demand being little changed in the past few weeks. A few informal inquiries are before the market, but future commitments are rare. Some foundries, on specialties, are less active. Prices remain firm.

St. Louis—Shipments and the melt of iron are holding at the recent high rate, but some recession in new ordering is noted. Stove and implement makers account for a large portion of the melt, and jobbing foundries have increased their backlogs, despite recent heavy shipments. Prices are steady.

Birmingham, Ala.—The market is lagging considerably, but production is being maintained, and the base price is unchanged. No intimation is given of a new quotation for the third quarter. Steady melters are buying against early needs, but in small quantities.

Reductions of $2 to $3 a ton in railroad freight rates on pig iron from this district to Arkansas, Louisiana, Kansas, Oklahoma and Texas are expected to boost shipments by 25,000 tons a year. In 1935 the district shipped less than 3000 tons to

the five states, where foundries had turned increasingly to the melting of scrap iron. The new scale brings the rates down to $5 to $6 a ton. Fifteen lines approved the reductions.

Scrap

Scrap Prices, Page 73

Pittsburgh — The market slowed last week to its least active state of the year as consumers showed no interest in buying scrap at the $14.50 to $15 range, which was based on the last sale here two weeks ago. One mill ventured a buying offer of $14 a ton, but there were no takers. The market on machine shop turnings has reacted 50 cents a ton to $9.50 to $10, compressed sheet scrap is off 25 cents to $14.50 to $15, and only cast scrap and, to an extent, railroad specialties show any degree of life.

Cleveland—Although a decline of $1 a ton on several heavy steel grades has been made the past week and weakness was evident at times, sentiment has undergone a change and the market shows renewal of strength, compared with the former spirit. Buying has not been resumed but seems likely to start before long. Shipments on contracts are steady.

Chicago — Scrap again has declined under the influence of quiet demand and heavy offerings. Heavy melting steel is down 50 cents to a top price of $13 and most other grades are off similarly. Shipments against orders continue heavy, but larger consumers show little interest in making new commitments.

Boston—With new scrap buying slower both for export and domestic shipment and with supplies available in greater volume, brokers' buying prices in this territory continue to ease off. Declines of 25 cents to 75 cents a ton are reflected in buying prices on forge flashings, heavy melting steel for export, railroad malleable and steel shafting.

New York—Scrap exporters are having difficulty making shipments abroad because of higher ocean rates. As a result a large number of loaded barges have accumulated under demurrage. As a result of this situation the brokers have dropped buying prices for export by 25 cents to 50 cents a ton. New domestic buying is light and on the whole the current supply of scrap is greater than demand. On cast grades scrap brokers have reduced buying prices 25 cents a ton.

Philadelphia — Lacking test of substantial buying, scrap prices here appear more stable. Reductions are noted in a few grades, but as far as domestic quotations are concerned, the market is unchanged this week on the major items. Meanwhile, the export market continues to lag—a depressing factor—with dealers now offering $11.50, delivered, Port Richmond, for No. 1 steel for shipment abroad. This price represents the second reduction of 50 cents in two weeks and the third such reduction in four weeks. Reductions over the past week affect couplers and knuckles, low phosphorus steel crops, and rolled steel wheels.

Buffalo — Largest local melters have reduced offers for scrap to $13 for No. 1 heavy melting steel. This action followed large purchases over a period in which prices gradually were scaled down from $14.50 to $13.50. There are reports that radiator makers have bought heavily, purchases including several grades.

Detroit—In absence of buying last week prices dropped 50 cents to $1 a ton, the sharpest decline locally in several years. The market is weak and does not indicate early strength.

Cincinnati — Further weakness in iron and steel scrap has caused a decline of 50 cents on heavy melting steel and malleable. Mill buying is at a minimum.

St. Louis — Additional sharp price cuts have been made in iron and steel scrap. The main factor in the weakness has been lack of buying and liberal railroad offerings since the end of April.

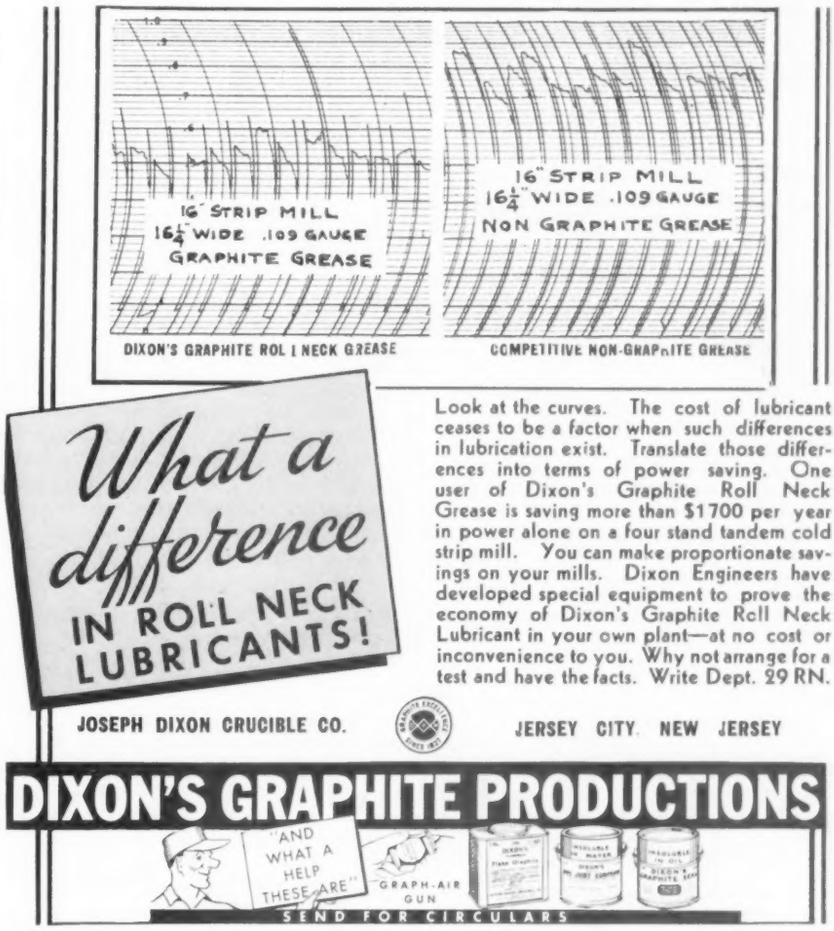
Birmingham, Ala.—Prices have shown weakness and some grades are off 50 cents. Buying is spotty, as needs dictate.

Seattle—Without export support, the market lacks firmness although prices are nominally unchanged at $10 to $10.50 for No. 1 heavy melting steel and $12.50 for rails. Export houses are exercised over an increase in freights to Japan, June 1, from $3.50 to $4 and $4.25 but this may be offset by an easier space situation next month. Local mills continue to buy to cover requirements. Prices are steady at $10, base, for No. 1 and $8 for No. 2 per gross ton.

Semifinished

Semifinished Prices, Page 71

The semifinished market holds firm at $28, base, Pittsburgh, for rerolling billets, slabs and sheet bars, with wire rods $38 for the lowest of the three base size classifications. Specifications are declining somewhat but are still led by sheet bars for tin plate and sheet makers.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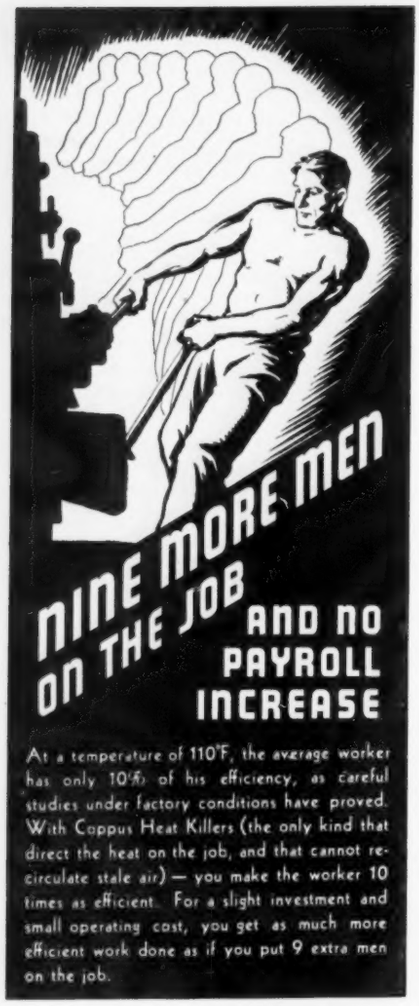

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Warehouse

Warehouse Prices, Page 74

New York—Demand for finished rolled steel products out of warehouse continues to improve and the daily average now is somewhat in excess of that in April. Prices are unchanged. A considerable quantity of foreign steel, mainly bars and shapes, continues to feature the market, but the prices on the foreign material are not having any disturbing effect on domestic prices.

Chicago—The upward tendency in warehouse sales the past four months has been replaced by a sidewise movement, but the volume generally is regarded as satisfactory. Building materials are experiencing moderately improved demand. Prices are unchanged.

Detroit—Led by demand for channels and other shapes, as well as galvanized sheets, the local jobbing trade is now at its peak for the year in respect to specifications and shipments. Orders are not only more numerous but run to larger size individually. Prices are unchanged.

Cincinnati—Warehouse volume is holding at the higher level recently established, chiefly on more active industrial ordering. Recent sales also represent numerous light building jobs.

St. Louis—Demand for steel and iron from store continues brisk and well diversified. New orders and specifications so far this month are running slightly ahead of the comparable period in April and well over a year ago. Railroad buying is active. Prices are firm and unchanged.

Seattle—May has developed active buying of all items in stock. Plates and bars are in good demand. Sheets are also moving freely, but Portland interests are reported to have invaded Seattle territory with slashed prices. Otherwise the price schedule is well maintained. Shipyard requirements and industrial repair jobs have stimulated the turnover of warehouse items.

Tin Plate

Tin Plate Prices, Page 70

Pittsburgh—Tin plate for canmaking appears to have improved noticeably in May, the requirements for beer and oil containers being outstanding. The 95 per cent rate of operation is an advance of 5 points from a week ago, supported chiefly by the 98 per cent rate by the leading interest, which last week placed 20 mills at its formerly idle New Castle, Pa., works on schedule. Producers are running greatly in arrears on cold-reduced tin plate deliveries. Inasmuch as packers' can prices have been agreed upon for the balance of the 1936 season, it is unlikely that the present $5.25 per base box market on tin plate would be included in proposals to advance finished steel prices for the third quarter.

Iron Ore

Iron Ore Prices, Page 73

Cleveland—Ice conditions in the upper lakes are clearing and ore carrying vessels to the number of almost a hundred are moving into the usual seasonal routine swing. Fog still interferes somewhat in Lake Superior, delaying departures from Duluth-Superior harbors for as much as 12 hours at a stretch; but these intervals are becoming less frequent. The first two boatloads of ore, totaling 17,604 tons, arrived a few days ago at Fairport, O.

Ferroalloys

Ferroalloy Prices, Page 72

New York — While April was one of the best months in some time in point of shipments ferromanganese sellers believe May will not be far behind. Prices are unchanged, with announcements for third quarter not expected much before the middle of next month. Domestic spiegeleisen is steady.

Nonferrous Metals

Nonferrous Metal Prices, Page 72

New York—Price firmness continued in domestic copper, lead and zinc markets last week while demand from consumers was light. Straits tin prices held fairly steady but antimony declined rather sharply.

Copper—All first hands quoted electrolytic unchanged at 9.50c, Connecticut. This market is in a favorable statistical position with April world statistics showing a drop of 12,000 tons in refined stocks, an increase in apparent consumption and a decline in output.

Zinc—Fresh demand was slow but shipments held up well reducing unfilled orders on sellers' books further. A potential increase in new buying is being accumulated. Prime western held at 4.90c, East St. Louis.

Tin—Straits prices held fairly steady despite exchange rate fluctuations and price movements abroad.

Nearby supplies were tight during most of the period and spot closed around 47.00c.

Lead — Demand slackened but prices held at 4.45c, East St. Louis. Good buying volume is expected for the balance of the month.

Antimony—American spot dropped sharply to 12.00c on weakness in Chinese futures offerings here and abroad. Chinese spot closed nominally unchanged at 13.50c, duty paid New York. Buying was light.

Metallurgical Coke

Coke Prices, Page 71

Large contracts for beehive furnace coke have recently been placed by the Hanna Furnace Co. for Buffalo shipment and by the Chateaugay Ore & Iron Co., Lyon Mountain, N. Y. Both of these contracts were placed with western Pennsylvania suppliers and it is understood that the market of $3.50 to $3.65 per ton, f.o.b. Connellsville, Pa., governed. A strong demand for both common and premium beehive foundry coke is still a market feature, and prices on the former range $4.25 to $4.35 per ton, with the latter named $5.35 to $5.50, both on the basis of f.o.b. Connellsville, Pa.

Foundry by-product coke shipments at Chicago indicate a small increase of consumption over last month. Cincinnati suppliers find a slight decline in demand, with prices steady. At Birmingham, Ala., production is steady and demand has reduced oven stocks slightly.

Bolts, Nuts, Rivets

Bolt, Nut, Rivet Prices, Page 71

Buying of bolts, nuts and rivets so far this month has lagged behind the April rate though lately a moderate increase has developed. Demand continues well ahead of the volume a year ago, particularly from railroads and farm equipment manufacturers. While some progress has been made toward attainment of stable prices, concessions have not been eliminated entirely.

Coke By-Products

Coke By-Product Prices, Page 71

New York—A growing shortage of toluol and industrial xylol is the principal feature in the coal tar products market. This shortage is said to be due principally to continued heavy demand in connection with finishing schedules of the automobile industry. Demand continues sufficient to absorb the entire production. Prices are unchanged but firm on all items.

Steel in Europe

Foreign Steel Prices, Page 74

London — (*By Radio*) — After establishing an all-time record in steel tonnage in March, producers in Great Britain set a further high mark in April. Steel production in April was 991,500 gross tons, a daily average of 38,134 gross tons, compared with 980,100 tons in March at a daily average of 37,696 tons.

Pig iron production in April was 629,800 gross tons, compared with 633,600 gross tons in March. The daily rate in April was 20,933 gross tons and in March 20,439 tons, the shorter month giving the apparent loss in April. Active stacks at the end of April were 112, compared with 109 for March.

Shortage of pig iron is unabated in the British market and second half orders are accepted only on the basis of the price prevailing at time of delivery. Exports have been stopped except for 1000 tons of hematite for the United States.

The steel trade continues fully active on existing contracts, deliveries are extended and new business quiet. Sheet exports are dull, including galvanized.

The Continent reports markets slow, except for semifinished steel and structurals.

Quicksilver

New York—Quicksilver prices continue easy, sellers quoting $75.50 to $76.50 on small lots to 15 to 25 flasks. Larger lots are available down to $75 a flask. Demand is light, being confined to scattered small-lot inquiries.

Claude B. Schneible Co., Chicago, engineer and builder of dust and fume suppression equipment, has enlarged its sales facilities by appointing the following sales representatives: Parry Engineering Co., 154 Nassau street, New York; Ferninand G. Schultz, 215 Questend avenue, Pittsburgh; Grant & Co., 2144 East Seventh street, Los Angeles; Pacific Graphite Works, Fortieth and Linden streets, Oakland, Calif., and Carl F. Miller & Co., 228 West Pacific avenue, Spokane.

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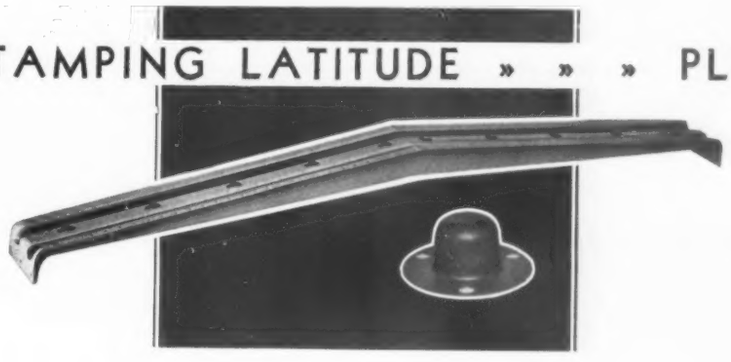

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Financial

AMERICAN Rolling Mill Co., Middletown, O., reports net earnings of $743,903 for the first quarter, after allowing for depreciation, interest and taxes. This is equal, after dividend requirements of the preferred stock, to 34½ cents a share on the 2,072,512 common shares outstanding. The report represents a loss compared with earnings of $1,371,474 in the similar quarter of 1935.

Net income for the year ended March 31 was $3,683,540 after interest, taxes and depreciation. This is equivalent to $1.94 on the 1,835,521 average shares of common stock outstanding during this period.

WILL REDEEM DEBENTURES

Union Drawn Steel Co. has issued a notice to holders of 20-year 6 per cent coupon gold debentures, due Jan. 1, 1950, that it has elected to redeem and retire all debentures outstanding, July 1, 1936, at the redemption price and accrued interest thereon, together with a premium of 5 per cent. Redemptions will be made by the Commonwealth Trust Co., Pittsburgh, and on and after July 1, interest on these debentures will cease.

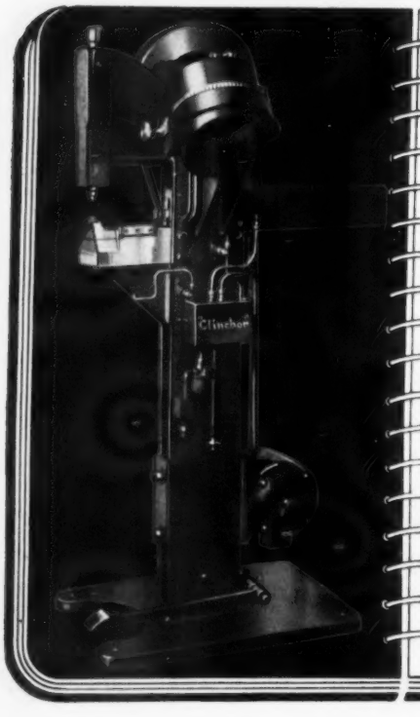
Further Comparison for Integrated Producers of Steel

This table, which first appeared in the May 4 issue, page 24, is enlarged by reports of additional companies last week

All figures are earnings, except where asterisk denotes deficit.

	First Quarter 1936	First Quarter 1935	Fourth Quarter 1935	Ingot Capacity gross tons
United States Steel Corp.	$3,376,304	$2,173,801*	$5,326,417	26,657,000
Bethlehem Steel Co.	603,065	607,298*	2,396,026	9,360,000
Republic Steel Corp.	361,031	1,834,235	1,191,439‡	6,053,000
Jones & Laughlin Steel Corp.	933,279*	794,789*	117,747**	3,660,000
Youngstown Sheet & Tube Co.	1,897,229	595,770*	1,493,734	3,120,000
American Rolling Mill Co.	743,904	1,371,474	1,302,618	2,431,720
National Steel Corp.	2,377,145	3,367,633	2,532,693	2,240,000
Inland Steel Co.	1,934,632	2,465,797†	2,749,309	2,000,000
Wheeling Steel Corp.	10,922	934,571	1,246,158	1,750,000
Colorado Fuel & Iron Corp.	726,270	51,490	166,272	888,000
Otis Steel Co.	148,676	952,362	868,212	828,000
Gulf States Steel Co.	96,929	30,148	119,350	480,000
Allegheny Steel Co.	336,964	324,146	404,708	476,000
Granite City Steel Co	61,217	134,581	203,358	400,000
Continental Steel Corp.	54,343	.....	.....	280,000
Wickwire Spencer Steel Corp.	121,651*	75,782*	107,123	150,000
Ludlum Steel Co.	163,012	198,521	153,666	38,000
Total	$11,926,712	$7,417,518	$20,378,830	57,811,720

‡Includes Corrigan-McKinney after Sept. 25. **Estimated.
†Does not include Joseph T. Ryerson & Son Inc.



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Feeds and Sets CLINCH NUTS Automatically

A NEW TYPE of machine answering the demands for better production methods for setting Clinch Nuts.

The clinch nut, which has been automatically placed on the anvil, locates the work. The ram coming down sets the clinch nut.

May we send you a circular describing the many details so important for successful production?

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Transportation

THE luxurious streamlined steam train, now under construction by New York Central, for operation on a fast round trip daily between Cleveland and Detroit, via Toledo, will be named The Mercury, after the latin mythological god of commerce. The train will be placed in regular service next month following an exhibition tour covering several cities. This is of interest to many iron and steel men who travel between these cities.

The new train, air-conditioned throughout, is of unique design and has many innovations in appointments and mechanical features. Especially in its floor plan and decorations it will differ materially from existing trains.

Its seven, full-dimensioned cars are constructed of steel, but will be substantially lighter than present standard equipment. The streamlined locomotive was built in the railroad's own shops at West Albany, N. Y., and the cars are nearing completion in the Central's Big Four shops at Beech Grove, Indianapolis.

CUT SOUTHERN IRON RATES

Railroad rate retuctions of $2 to $3 a ton on pig iron from Birmingham, Ala., to points in Louisiana, Arkansas, Oklahoma, Texas and Kansas have been announced. Producers look for a substantial increase in shipments to these states, some predicting the movement will be boosted by 25,000 tons a year. Last year less than 3000 tons was shipped from the Birmingham district to foundries in the five states. The reduction amounts to about 33 per cent, bringing the rates down to $5 to $6 a ton.

Search for Railroad Site Carnegie Had Surveyed

Pennsylvania state highway department engineers, who had been delayed throughout the winter and early spring by snow and floods, have resumed their survey of the "lost" railroad from Pittsburgh to Harrisburg, Pa., which was started by Andrew Carnegie.

Over 50 years ago, Mr. Carnegie with Cornelius Vanderbilt and others spent more than $10,000,000 in the construction of tunnels, roadbed, etc., for an independent railroad linking Pittsburgh with the East. The railroad was designed principally as competition for the Pennsylvania railroad.

It is now planned possibly to use the

right-of-way of the old railroad for a super-highway.

Sees Congress Quit June 6

Senator Robinson, senate majority leader, stated Friday afternoon that with the help of Republican members he hoped that congress would be able to adjourn by June 6. He said that there are four major bills yet to be passed, including tax, relief, flood control, and commodity exchange. He hoped that some others would be passed, but these four are "must".

Marks 60 Years in Business

Celebrating its sixtieth anniversary this month, the Broderick & Bascom Rope Co., St. Louis, outlines phases of its growth in the current issue of its house magazine *The Yellow Strand*. The company claims the distinction of being the first wire rope manufacturing concern west of the Allegheny mountains.

Prosperity Too Glowing!

LAST week at Pittsburgh, steel's prosperity and clear weather caused a flood of telephone calls to the fire alarm operator one night. The glow from bessemer and open-hearth steel furnaces was so distinct that many Pittsburghers called to ask where the fire was.

IRON AND STEEL ELECTRICAL ENGINEERS PREPARE PROGRAM

Approximately 35 technical papers covering all phases of steel mill operations will be presented by leading authorities at the thirty-second convention of the Association of Iron and Steel Electrical Engineers to be held in Detroit, Sept. 22-25.

Among features of the convention program will be inspection trips to the Ford Motor Co., which recently completed a 54-inch hot strip mill, and Great Lakes Steel Corp., which has just put its new 96-inch hot strip mill into operation.

The Iron and Steel exposition, to be held concurrently with the convention promises to be one of the largest ever sponsored by the association. Already 98 per cent of the space has been reserved by 125 manufacturers of steel mill equipment. Probably it will be necessary to arrange for additional space to accommodate the unusual demand.

Mirrors of Motordom

(*Concluded from Page* 26)

ard has seemingly been slow developing the "115" (so called because this, the coming six, is 5 inches shorter in wheelbase than the 120). But a production schedule on the 115 has been set up to have assemblies start in late July. The Packard organization has before it the aim of attaining 300 115's per day on August 15.

To date some of the delay on this line has been encountered by several changes in the interior, for it was a predetermined policy at Packard to clearly differentiate it from the 120 by distinctively styling the instrument panels, seats, trim, etc. on the six.

But the fact that the frame, fender, radiator, body panel, motor and other more vital parts have not only been approved but also made ready for production assembly bespeaks the proximity of the new line of Packard sixes.

Equipment

Chicago—With backlogs accumulating, machine tool builders are faced with an active summer. New business is holding up well, and sellers generally can count on the steady flow of inquiries developing into orders promptly. Buyers who have turned to used machinery when unable to get early shipment of new tools find a scarcity of modern equipment. Inquiries and interest developed by the recent Detroit foundry convention now are being reflected in heavier bookings. Extensive improvement programs planned by several bituminous coal companies for this summer are expected to involve the purchase of mining machinery, rails and cars as well as miscellaneous repairs to properties.

Pittsburgh—Extensive blast furnace relining and rehabilitation work is an active factor in the equipment market in this district, with Carnegie-Illinois Steel Corp.'s plans dominant. Included in proposed work is relining and repair work to several Carrie stacks, as well as rearrangement of blast furnace facilities at Edgard Thomson and Duquesne works.

Seattle—Alaska is buying equipment and machinery in volume as mining and canning get under way. The logging and lumber industries in both British Columbia and on the American side are active in the market for new equipment and replacements. Dealers report sales far ahead of a year ago.

CASE HISTORIES in the WELLMAN PLANT

The Mystery of McAdams

"IS Sherlock Holmes in?" The visitor's expression of worry was in strange contrast to his humorous question. "If he is," he went on, "I've got a mystery to puzzle him."

•

Wellman engineers asked for details and found that the McAdams company's machine department was charged with unnecessary expense because of defective machine work. The cored castings used were heavy and cores did not place properly in the mould.

The solution meant increasing the size of the core prints. This led to the production of fine castings with perfect cores, thereby eliminating the difficulties in the machine department.

This is one of the many cases which Wellman engineers have solved. We are ready to help you with your problems. Write, or call ENdicott 2240.

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- Bent Tubes

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Construction and Enterprise

Michigan

BAY CITY, MICH. — State Boiler Co. has purchased equipment and plant of Bay City Iron Works, 1301 North Madison avenue, and will construct an addition.

BAY CITY, MICH. — Dow Chemical Co., Midland, Mich., Willard H. Dow president, has purchased the plant in Bay City of the Union Motor Truck Co., owned by Besser Mfg. Co., Alpena, Mich. New machinery may be installed and the plant reconditioned.

BAY CITY, MICH.—Bay City Mfg. Co. will be organized here as a subsidiary of the Electric Auto-Lite Co., Champlain and Mulberry streets, Toledo, O., following agreement by the chamber of commerce to raise $75,000 among industrial leaders. This amount is part of the $150,000 necessary to remodel and install new machinery in the former Wildman Rubber Co. plant, which the new company will occupy. Rolled metal and bakelite products and lithographed dashboard dials will be manufactured.

BENTON HARBOR, MICH. — Victor Tool & Machine Corp., Park and Fourth streets, has been incorporated for merchandise manufacturing. Walter Miller, Benton Harbor, is correspondent.

DETROIT—Detroit Die & Machine Co. has been incorporated, with Charles C. Layman, 3266 Yemans street, Hamtramck, Mich., correspondent.

DETROIT—Climax Molybdenum Co., 15 East Bethune street, plans one-story, 60 x 200-foot factory and laboratory on Woodrow Wilson avenue. Architect is Clair W. Ditchy, 703 Fisher building.

DETROIT—Champion Piston Ring Co. has been incorporated to manufacture motor parts. Correspondent is Fanne C. Getts, 11629 Linwood avenue.

DETROIT — Fruehauf Trailer Co., 10940 Harper avenue, is constructing an addition.

DETROIT — Chrysler Corp., 341 Massachusetts avenue, will erect a press building at Ford and Wyoming roads. Albert Kahn Inc., New Center building, architect.

DETROIT — Allen Industries Inc., Leland avenue and Grand Trunk railroad, is starting construction of a new plant.

ESCANABA, MICH. — Board of education will take bids soon for boilers and accessories in two city schools. Wallsworth & Trickler, Marinette, Wis., are engineers.

FLINT, MICH.—Buick Motor Co., Hamilton avenue, is building an addition to its forge plant to be 38 x 70 x 129 feet, to cost $26,000, without equipment. New heat treating equipment will be installed.

GRAND RAPIDS, MICH. — Grand Rapids Mfg. Co., 535 Bond avenue, Northwest, has been incorporated to deal in machinery. Correspondent is E. C. Billbury, 1037 Michigan Trust building.

MT. CLEMENS, MICH. — Covered Wagon Co., manufacturer of house-type trailers, is expanding its production facilities, including the machine shop and metal woodwork departments. W. J. C. Kaufman, St. Clair Shores, Mich., has general contract for building.

WATERVLIET, MICH.—Watervliet Paper Co. will construct an addition to its mill, for which John Yerrington and Gettman Bros., South Haven, Mich., have general contract.

Ohio

AKRON, O.—City plans sewage plant improvements, to include machinery and two tanks, cost to be $105,000, and bids will be asked soon. William F. Peters is service director, city hall.

BELLEVUE, O.—Village is taking bids May 27 for construction of raw water pumping station to cost $8000. C. A. Williams is service director, and George B. Gascoigne, 1140 Leader building, Cleveland, is engineer.

BRYAN, O. — Aro Equipment Corp., J. C. Markey president, plans addition to double capacity, to be completed by August 15.

CLEVELAND — Pressure Castings, 12345 Euclid avenue, David Ralls president, is expanding its manufacturing facilitiese. The company manufactures aluminum and zinc die castings.

CLEVELAND — Clark Controller Co., 1140 East 152nd street, will build a $30,000 addition, 50 x 60 feet, with an L 30 x 50 feet. J. L. Hunting Co., Ninth and Chester building, is engineer.

CLEVELAND—Lindsay Wire Weaving Co., 14025 Aspinwall avenue, Northeast will construct a $10,000 addition to its plant, for which James C. F. Shafer Co., Smythe building, has general contract.

CLEVELAND—Able Fire Escape & Iron Co. has been incorporated by Walter S. Eagan, Tony Aiello and Raymond W. Grace. James C. Connell, 1350 Terminal Tower building, is correspondent.

DOVER, O. — City will take bids in 30 days for construction of new light plant building, to cost $70,000 instead of $41,000 as reported previously. Building will be 55 x 100 feet, to house two boilers with coal crushers and additional equipment, one turbine, pumps and auxiliaries, with room provided for another boiler later. Homer Keppler is city service director, City hall. Arnold, Rosch & Hartline engineers, New Philadelphia, O. (Noted STEEL April 20.)

LORAIN, O. — Steel Stamping Co., 3553 Broadway, is considering erection of plant additions to manufacture pressed metal toys. Joseph Gould is president.

NEWARK, O.—Owens-Illinois Glass Co. laboratory was destroyed by fire last week.

SOUTH CHARLESTON, O. — Village plans municipal electric light plant, and has authorized Ralph Pancake, South Charleston, to negotiate with an engineer. C. D. Juvenal is mayor.

TOLEDO, O. — Council has authorized purchase of two 500-horsepower boilers with stokers and appurtenances, a 40-kilowatt turbogenerator, water feed apparatus, and a steam-driven pumping engine. George Schoonmaker is service director.

Illinois

CHICAGO — Fibre Can Corp., 1200 Fullerton Parkway, has been organized by C. D. Patterson, H. M. Kelley and W. A. S. Mulligan to manufacture and deal in containers. Correspondent is Winston, Strawn & Shaw, First National Bank building.

CHICAGO — Frohwitter Machinery Mfg. Co. Inc., 135 South La Salle street, has been organized by Arthur E., Laura W. and William G. Frohwitter. Corre-

(*Please turn to Page* 92)

Quicker Handling

of Scrap, Pig Iron, Pipe, Coiled Steel & other Finished Products

results in Better Profits

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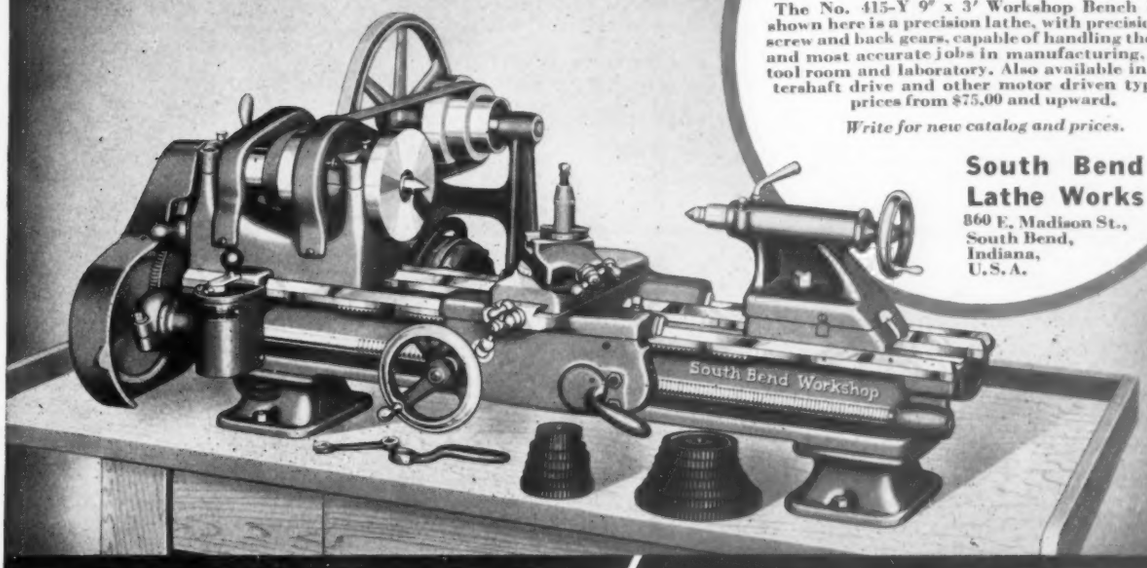

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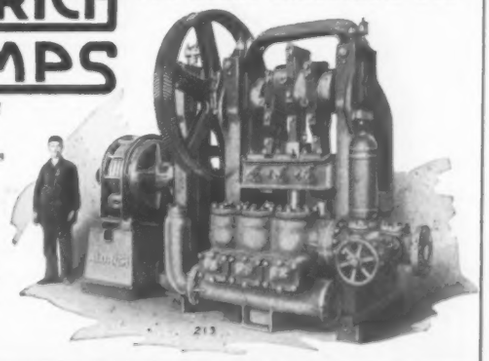

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99 Fearing Blvd., Toledo, Ohio
Detroit Office: Stormfeltz-Lovely Bldg., Detroit, Mich.

(*Continued from Page 90*)

spondent is Maurice A. Barancik, 135 South La Salle street.

FREEPORT, ILL. — Kraft-Phenix Cheese Corp., 400 North Rush street, Chicago, will build a five-story cold storage and refrigerator plant on East Stephenson street, Freeport, to cost $125,000.

JACKSONVILLE, ILL. — City plans municipal power plant to cost $420,000, with federal aid.

Indiana

ASHLEY, IND.—City will take bids soon for electrically operated pumping machinery and auxiliary equipment for waterworks station, to cost $95,000. Lennox & Matthews engineers, Architects & Builders building, Indianapolis.

COLUMBUS, IND. — Cummings Engine Co. plans large expansion in diesel engine manufacturing facilities. Trundle Engineering Co., Card building, Cleveland, is engineer.

INDIANAPOLIS — American Can Co., 1936 South East street, has leased the No. 2 plant of the Marmon industrial district at 1001 York street, comprising 50,000 square feet of floor space.

Connecticut

HARTFORD, CONN. — Hamilton Standard Propeller Co., 400 South Main street, taking bids for construction of plant with 100,000 square feet of floor space for manufacturing airplane propellers. Cost will be over $40,000. Albert Kahn Inc., New Center building, Detroit, is architect.

STAMFORD, CONN. — Pitney Bowes Postage Meter Co., 763 Pacific street, J. H. Williams manager, plans two-story addition on North Pacific street, to cost $37,000. Architect is H. Chapman, 95 Hope street.

Massachusetts

BOSTON — Bureau of docks and yards, navy department, Washington, is taking bids for one steam-driven air compressor with 5000-cubic feet per minute capacity, schedule 8012, to be delivered to Boston navy yard.

Vermont

PUTNEY, VT. — Town plans electric light plant and has voted $50,000 bonds to finance it. A. M. Corsas is town clerk.

New York

BUFFALO—Samuel Greenfield Co., 174 Gilbert avenue, will remodel a building on Bailey street which it recently leased and will build an adjacent addition. A nonferrous metal smelting and refining plant will be operated following renovation.

MASPETH, N. Y. — Starcor Realty Co., 5515 Grand street, is taking bids for construction and equipment of factory to manufacture corrugated boxes, work to cost $110,000. L. Davidson, 55 West Forty-second street, New York, is engineer.

NEW YORK—International Cement Corp., 342 Madison avenue, will build a large plant in Argentina. John Oakes, Andover, N. Y., is engineer.

NIAGARA FALLS, N. Y. — Niagara Alkali Co., Buffalo avenue, will extend present power house and install two boilers, turbines, power machinery and auxiliary equipment, cost to be $150,000.

ONEONTA, N. Y.—Village plans rehabilitating West End sewage disposal plant which was damaged by floods. Cost of work estimated $23,000. F. M. Gurney is city engineer.

PERRY, N. Y. — City plans electric light and power plant and will hold election soon to approve financing of $250,000. L. C. Reynolds, Geneva, N. Y., is engineer.

SIDNEY, N. Y. — Scintilla Magneto Co. plans plant addition to cost over $37,000.

Pennsylvania

BEECH CREEK, PA. — Borough will receive bids at its public school house until June 1 for construction of water supply system to include chlorinating plant. Engineer is George M. Busch Jr., 112 West Fourth street, Williamsport, Pa.

BRADFORD, PA. — Sloan & Zook Co., 101 Main street, oil refiner, plans pumping station for development of oil properties in Venango county, to include gasoline engine driven units with accessories, and to cost over $500,000.

DAISYTOWN, PA. — Borough of Daisytown, Mrs. Marie B. Lintner secretary, rural delivery No. 2, Johnstown, Pa., will ask bids soon for construction of complete water supply system to include reservoir, pump lines and pumping equipment, total cost to be $88,500. No bids were received when asked

(*Please turn to Page 94*)

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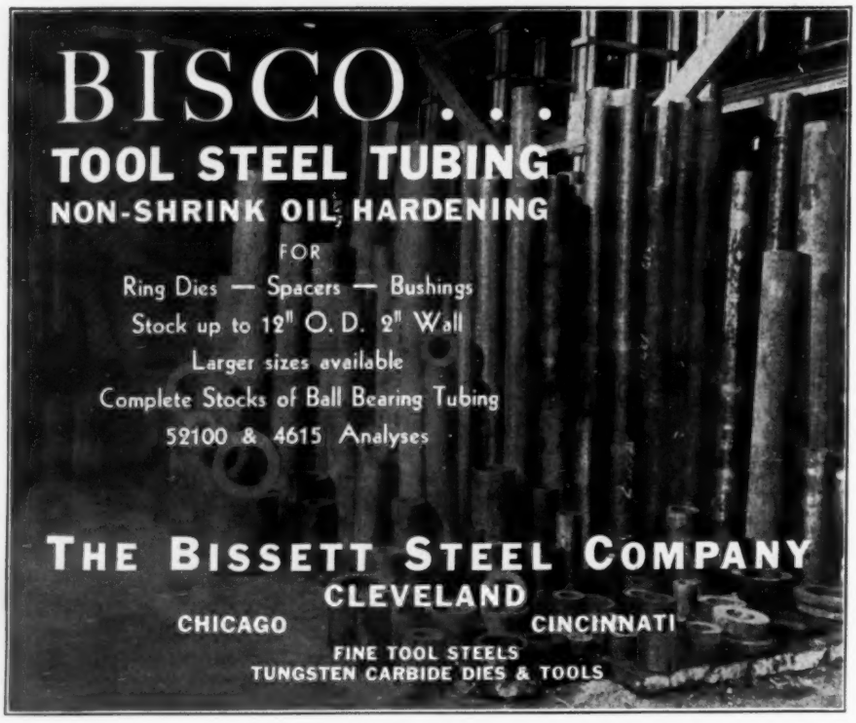

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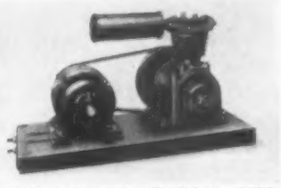

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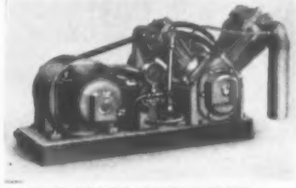

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WORTHINGTON

(*Continued from Page 92*)

April 30. Project is PWA docket No. 1394-R.

GIRARD, PA. — Voters have approved issue of $55,000 bonds for construction of new municipal light plant.

GLENSIDE, PA.—C. F. Mebus, Glenside, is engineer for Radnor and Haverford townships' commissioners, who plan to ask bids soon for construction of sewage disposal plant to cost $280,000.

McKEES ROCKS, PA.—Dunn's Mfg. Co. has been incorporated to manufacture container filling machinery, by Robert P. Barnett, Alexander L. McNaugher and William D. Armour.

McKEES ROCKS, PA. — Enterprise Can Co., Chambers street, will construct a plant addition, for which Hughes-Foulkrod Co., Oliver building, Pittsburgh, has general contract.

PITTSBURGH—Haggard Machinery Co. has been incorporated by W. T. and Lelia T. Haggard and A. P. Malkin.

PITTSBURGH—West Penn Power Co., West Penn building, will spend about $5,500,000 for expansion program largely at Springdale plant. Included will be installation of a new 50,000-kilowatt turbine, new buidings and transmission lines.

PITTSBURGH — Waverly Oil Works Co., S. M. Vockel president, Fifty-fourth street and Allegheny Valley railroad, plans either replacing present plant which was fire-damaged, or constructing a new plant with new tanks and equipment.

SHARPSVILLE, PA.—Western Steel Products Co., H. B. Small, president, plans erection of one new building and may remodel two others which were formerly occupied by Davidson Coke & Iron Co.

Virginia

OCCOQUAN, VA. — Arlington county plans hydroelectric power plant to cost over $100,000. Engineers are Wiley & Wilson, Lynchburg, Va.

RICHMOND, VA. — Hyman Viener & Sons, L and Colfax streets, Northeast, Washington, scrap dealers, have leased building formerly occupied by Southern Metal Refining Co. and will operate for smelting and refining battery plates. Isadore Davis is in charge.

WYTHEVILLE, VA. — R. P. Johnson is in the market for a high pressure locomotive boiler and engine, 25 to 35-horsepower.

Missouri

CAMPBELL, MO. — City plans improvements and extensions to light plant. H. V. Sewall is mayor.

HANNIBAL, MO. — International Shoe Co., 1509 Washington street, St. Louis, plans immediate construction of a plant addition here, to cost $275,000, including machinery and equipment.

ST. LOUIS — Monsanto Chemical Co., 1724 South Second street, plans enlargement of its power plant at Monsanto, Ill., and construction of a new plant at or near Columbia, Tenn.

ST. LOUIS—Mississippi Valley Equipment Co., 511 Locust street, is in the market for a Fairbanks-Morse diesel engine, style VA, with or without generator.

Arkansas

BENTONVILLE, ARK. — City will take bids soon for waterworks improvements to cost $43,000. Black & Veatch, 4706 Broadway, Kansas City, Mo., are engineers.

EL DORADO, ARK. — City plans municipal electric light plant to cost $575,000, with federal aid. George R. Crosley is mayor.

Oklahoma

ENID, OKLA. — C. L. Lewis, city engineer, is in the market for six 250-gallons-per-minute deep well turbine type water pumps.

HOLDENVILLE, OKLA.—Mid-Continent Petroleum Corp., Cosden building, Tulsa, Okla., plans boiler plant at refinery here, to cost $100,000.

HOOKER, OKLA. — Town plans power plant extensions and additions to cost $60,000.

OKLAHOMA CITY, OKLA.—City considering water supply improvements estimated to cost anywhere from $4,000,000 to $12,000,000, and a bond election will probably be held. Lee M. Bush is city engineer, City hall.

SAND SPRINGS, OKLA. — W. M. Mount and Charles Cooper will install equipment for steel oil storage tank manufacturing in building on southeast corner of Main street and United States

(*Please turn to Page 96*)

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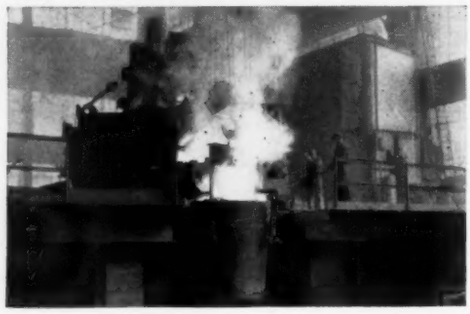

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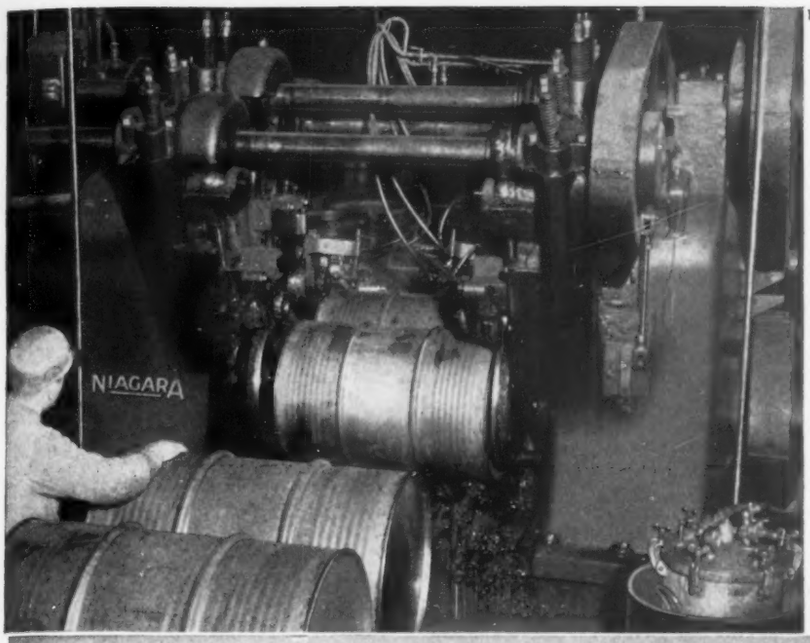

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(*Concluded from Page* 94)

highway 64. A slotter, rolling machine and giant punch will be installed.

Texas

GEORGETOWN, TEX. — City plans improvements to present electric light and power plant, including new generating equipment, line extensions, dynamos, etc. Cost estimated $30,000. J. R. Black is city manager.

HOUSTON, TEX. — Texas Electric Steel Casting Co. Inc., Bringhurst and Gillespie streets, is erecting a 70 x 100-foot extension to main building, to increase capacity 60 per cent.

SAN ANTONIO, TEX.—Bain Peanut Co., care of V. K. Woods, Quintana road, plans peanut plant to replace fire-destroyed one. All machinery and equipment will be replaced.

Wisconsin

MILWAUKEE—Continental Can Co., Pershing Square building, New York, may build a 200,000-square foot factory here.

NEENAH, WIS. — Alvord, Burdick & Howson, engineers, 20 North Wacker drive, Chicago, will take bids early in June for construction of new municipal water filtration and softening plant to cost $100,000. (Noted STEEL May 11.)

OCONTO, WIS. — Town plans installation of motor-driven pump and gasoline engine units in connection with steel standby and elevated tank, and other equipment for waterworks, to cost $175,000.

Minnesota

KASSON, MINN. — City plans construction of power plant building with generating units and distribution system. City clerk is H. R. Lundh.

MINNEAPOLIS—Gold Seal Asphalt Roofing Co., 50 Lowry avenue, North, roofing products manufacturer, is starting construction of two one-story additions to its plant, 26 x 51, and 85 x 105 feet.

MINNEAPOLIS—D. W. Onan & Sons, 43 Royalston avenue, manufacturer of portable saw units and farm lighting plants, is starting construction of a one-story factory addition, 50 x 80 feet.

PORT EDWARDS, MINN.—Nekoosa-Edwards Paper Co. is building an addition to its bleaching plant and will install two five-ton low density bleachers.

ROCHESTER, MINN.—Reid, Murdoch & Co. will build a one-story canning plant addition, 44 x 112 feet, for which Schwartz & Co., Rochester, has general contract, exclusive of machinery.

WESTBROOK, MINN. — City plans electric power plant and will arrange bond issue soon. T. V. Peterson is city clerk in charge.

South Dakota

SIOUX FALLS, S. DAK.—Ulberg & Sons Machine Works plans construction of a one-story machine shop and garage, 66 x 150 feet.

Iowa

MARSHALLTOWN, IOWA — Fisher Governor Co., pump governor manufacturer, will construct a one-story factory addition, 55 x 70 feet, with space for research laboratories.

TRAER, IOWA — City is considering extensions to municipal electric plant equipment. D. M. Shively, Traer, Iowa, is engineer making estimates of costs.

Nebraska

GRAND ISLAND, NEBR. — American Crystal Sugar Co. plans addition and alterations to factory and installation of new machinery and equipment, to cost about $60,000.

Colorado

ADAMS CITY, COLO. — Insul-Fluf Corp. plant here, just outside of Denver was destroyed by fire recently.

CLIMAX, COLO. — Climax Molybdenum Co. plans extensions to present boiler plant and construction of a new one. G. M. Musick, 204 Republic building, Denver, Colo., is engineer.

Montana

HEATH, MONT.—United States Gypsum Co., 300 West Adams street, Chicago, is taking bids for construction of a one-story factory and warehouse, 58 x 422 feet.

MISSOULA, MONT. — City Millwork Co. is starting construction of a one-story sash and door factory, 50 x 80 feet.

New Mexico

PORTALES, N. MEX. — City will take bids soon for extensions to present sewage system and renovation of present sewage disposal plant, work to cost $26,500. E. M. Gibbon, Portales, is engineer.

Utah

SIGURD, UTAH — Jumbo Plaster Co., W. P. Payne president, plans rebuilding plaster mill destroyed by fire in 1932. RFC has granted a loan of $75,000 to finance construction.

Pacific Coast

INGLEWOOD, CALIF. — Forrest Furniture Co., 1309 West Redondo boulevard, plans a 25,000-square foot factory, to cost $40,000.

LOS ANGELES — Studebaker Corp. plans a million-dollar addition to its assembly plant at 4530 Loma Vista avenue here.

LOS ANGELES — Public works branch, treasury department, Washington, plans power plant with heating and lighting distribution in connection with 16-story Federal building to be built in Los Angeles at Spring, Temple and Main streets. Bids will be asked soon. Entire project will cost approximately $6,250,000.

NEWBERG, OREG. — Springbrook Packing Co. plant was destroyed by fire recently, and rebuilding will begin at once. R. A. Bailey is president.

BELLINGHAM, WASH. — Bellingham Plywood Co. plans a plant on a three-acre site, for which it is negotiating with the Port of Bellingham. Alfred Wicks is president.

SEATTLE — Light department, City-county building, plans extension of distribution system and plant improvements to cost $500,000.

SPOKANE — George W. Wilkins, Hutton building, has organized the Western Machinery Co. to manufacture a hydraulically-driven and controlled automobile. First unit being fabricated by Standard Machine Works, Spokane.

TACOMA, WASH. — City light department, City hall, plans installation of transformers in distribution system. Cost will be about $25,000. C. D. Forsbeck is engineer, City hall.

TACOMA, WASH. — St. Regis Kraft Co., branch of St. Regis Paper Co., 230 North Michigan avenue, Chicago, W. W. Griffith resident manager, plans remodeling and enlarging plant closed since 1930.

Canada

EDMONTON, ALTA. — City is interested in prices of 15,000 and 20,000-kilowatt generators. A. Ritchie is superintendent of municipal power plant.

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